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# CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

COVER STORY

## Forging Ahead

### Bath Iron Works Launches A New IS Strategy

ALSO INSIDE

## Slashing Client/Server Development Time

AN INTERNATIONAL DATA GROUP PUBLICATION

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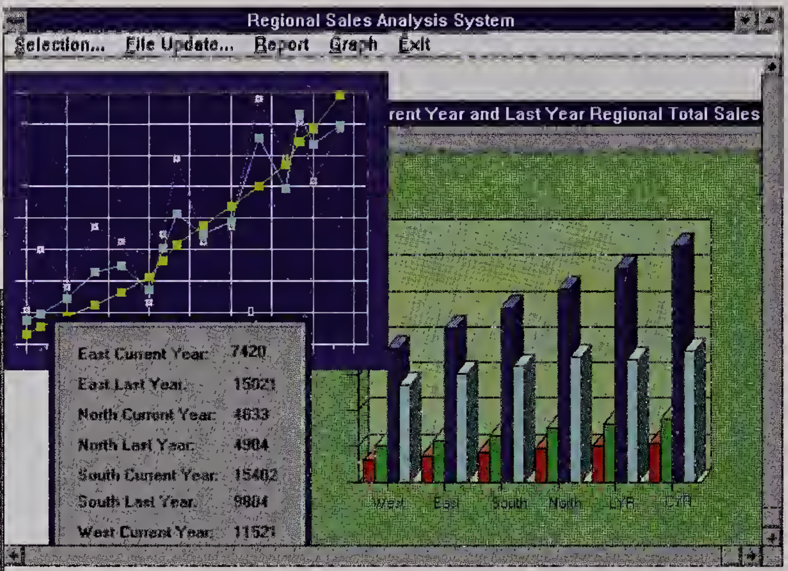
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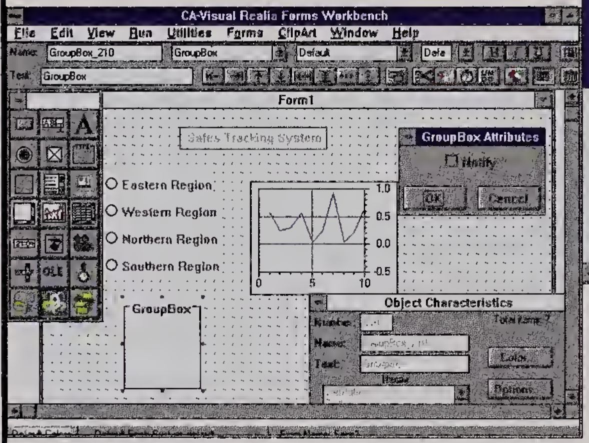

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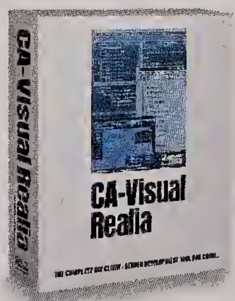

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# CIO

VOLUME 9, NUMBER 4

## COVER STORY

**PROFILE: BATH IRON WORKS** 42

### An Even Keel

The Cold War spending boom and subsequent bust left Bath Iron Works with lots of desktop systems and no easy way to access mainframe data. Will a top-down edict and a connectivity strategy help the shipyard steady its course?

*By E.B. Baatz*

*Making IS shipshape*
*Cover photo by*
*George Simian* **42**

*As the world turns* **58**

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**ROUNDTABLE** 58

### Dutch Masters

A discussion with seven executives in the Dutch information systems and services industry provides proof that, at least for IS management, it's a small world after all.

*By Richard Pastore*

*Time is of the essence* **64**

**APPLICATION DEVELOPMENT** 64

### Beat the Clock

Client/server development projects are notorious for their lateness. But some CIOs have learned how to identify and overcome the barriers to timely delivery of client/server systems.

*By Lynda Radosevich*

**EUROPEAN SPOTLIGHT: VOLKSWAGEN GROUP** 72

### Quality German (Re)engineering

With bald tires and the road ahead full of tacks, Volkswagen needed IT's help to retool its business for greater speed, lower costs and higher productivity—without running down its domestic workforce.

*By Jack Ewing*

*Shifting gears* **72**

MORE ▶▶▶

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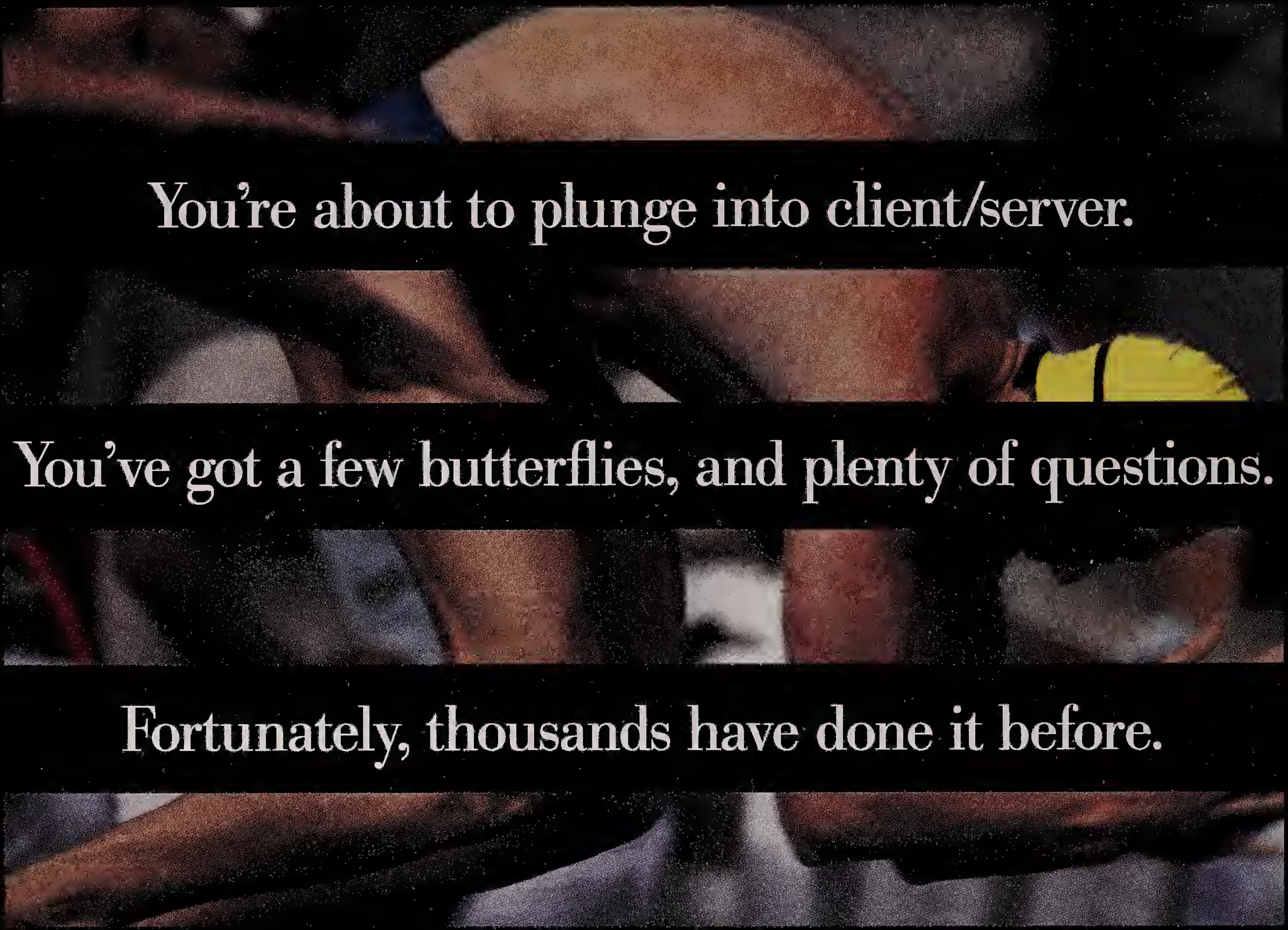
You're about to plunge into client/server.
You've got a few butterflies, and plenty of questions.
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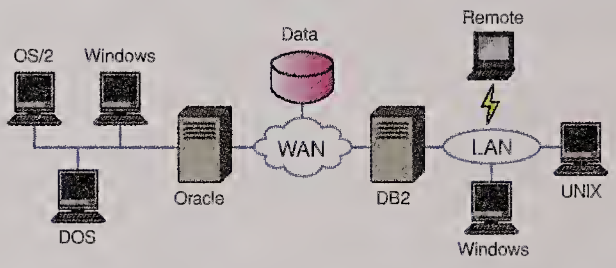

The challenges of moving to client/server are well documented. But so are the secrets of success.

IBM has helped companies all over the world design multivendor client/server systems to help them gain a competitive advantage, adapt to change and get closer to their customers. And we're eager to share our knowledge.

We've documented the experiences of many companies in our Client/Server Advisor. It's a vast Lotus Notes®-based library of proven solutions that demonstrates how others have solved many of the problems you face, and illuminates the potential pitfalls. It lets you look at the challenge from every angle, to find real solutions that truly enhance your business.

We're prepared to dive in with you, putting knowledge into action. IBM is committed to open standards, so we can help maximize current investments and integrate whatever new technology you might need. Whether it's made by IBM or anyone else. If you'd like to exploit our experience, call 1 800 IBM-3333, ext. JA110. Or visit our web site at http://www.csc.ibm.com to find out how we've helped others meet the challenge. Before you make the leap.

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# CIO

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**KNOWLEDGE MANAGEMENT** 28

**REPORTER'S NOTEBOOK:** ELUSIVE ASSETS

Meeting in Houston, business leaders address the challenges of managing knowledge.

*By Anne Stuart*

**VIRTUAL OFFICE** 36

**THINK TANK:** THE VIRTUAL AND THE PHYSICAL

The professional mobility enabled by technology is great. But there is a little-discussed dark side to virtuality.

*By Tom Davenport*

*Managing the intangibles* **28**

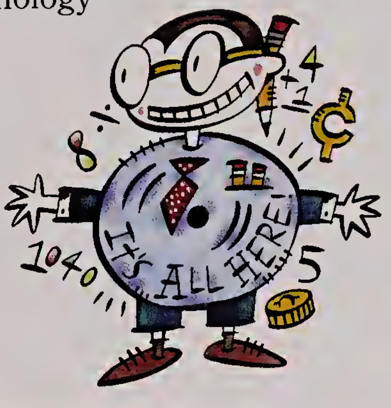
*Software for software* **80**

**CONFIGURATION MANAGEMENT** 80

**STATE OF THE ART:** GO CONFIGURE

The dilemma confronting most information technology specialists and managers today is not whether to use CM tools but, rather, which tools to use.

*By Daniel Gross*



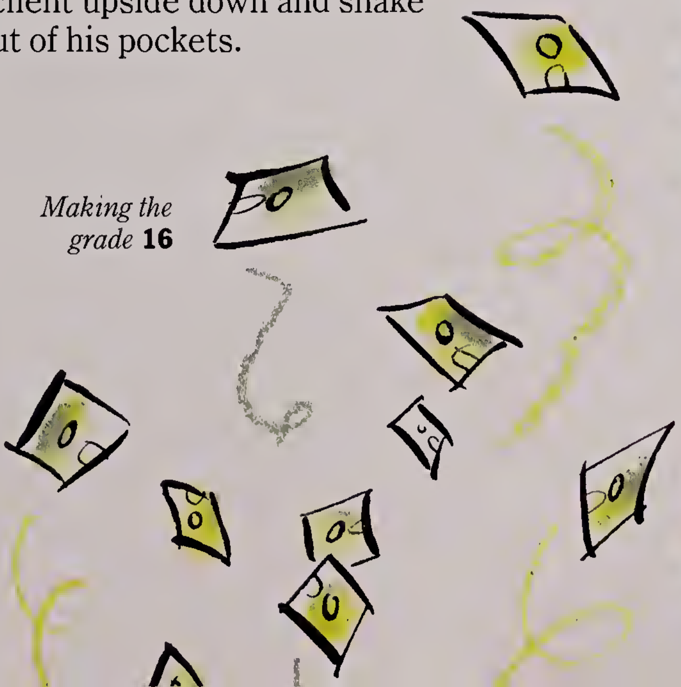
*Accounting that isn't too taxing* **16**

**CONSULTANTS** 96

**CIO CONFIDENTIAL:** MEET MY METHODOLOGY

Sometimes consulting seems confusing by design. But slowly it dawns on you that maybe the ultimate design is for the consultant to hold the client upside down and shake him until all the money falls out of his pockets.

*By W.F. Dyle*



*Making the grade* **16**

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- Organ donation network

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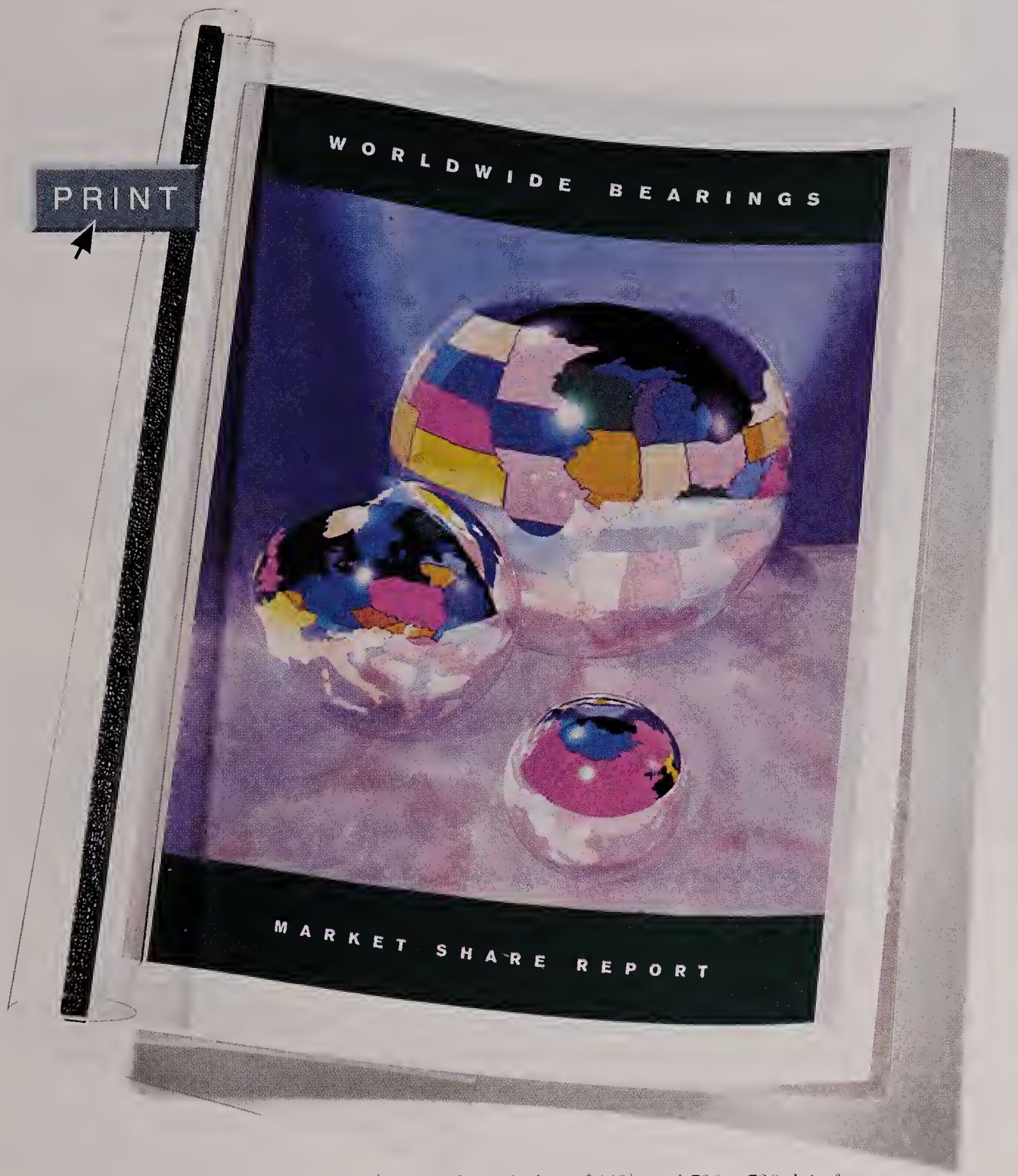

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The success rate of a business-critical application development project in Fortune 500 companies is 9 percent. Are you shocked?

Some IS executives think a 9 percent success rate is ridiculously *high*. Others find it amazingly low. But most agree that it's a reasonable figure.

The Standish Group International, a market research firm that derived that figure from its primary research, says a successful project is one that is delivered on time, on budget and with most of the features as originally specified. Failure is defined as a canceled project or a "runaway project," one that exceeds time and budget requirements by 100 percent with fewer features than specified. (By the way, the cancellation rate of projects in companies with annual revenues of more than $100 million is 31 percent, and the runaway rate is 53 percent.)

How can IS organizations improve their chances of success?

One way is to reduce application development time, which is what many organizations have in mind when they move to a client/server architecture. Speed of development primarily results from the use of graphical user interface prototyping tools to build and test the usability of new applications rapidly. These tools give developers the ability to respond faster to changing user needs.

But CIOs remain disappointed. Only half of the 400 CIOs surveyed in a 1994 Deloitte & Touche study said they derived the benefits they expected from their client/server development tools. The widest gap between expected and actual benefits was in the reduction of development time. Only one-third of respondents reported significant benefits related to speedier development.

As it turns out, tools are not the problem at all. As the saying goes, "a fool with a tool is still a fool." He simply creates bad code faster.

Rather, communication is the problem. Project development managers do not communicate effectively with management or end users. What happens in these cases is analogous to the old surgeon's joke: The operation was successful, but the patient died. The project was delivered, but it was OOA (obsolete on arrival) because internal requirements or external business conditions had changed.

Politics, changing user requirements, accelerated business cycles and competing priorities have much more to do with the success or failure of application development projects than any given tool. Contributing Writer Lynda Radosevich explains why in her feature story, "Beat the Clock," beginning on Page 64.

Smart IS organizations communicate continuously to increase their odds of success. That's not shocking. It's really rather simple.

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CIO

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## LETTER FROM THE PUBLISHER

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*"The process for using IT to facilitate transforming the organization, driving service responsiveness and increasing asset utilization has never been more important."*
*–F. Warren McFarlan*
*Sr. Associate Dean, Director of Research &*
*Professor of Business Administration*
*Harvard Business School*

In the spirit of fostering *CIO*'s mission to provide information and programs that help IT executives connect IT to profitability, we are pleased to announce the fourth annual Enterprise Value Retreat to be held Jan. 21-23, 1996, at the Arizona Biltmore. In the words of many past participants, "It is an event you cannot afford to miss."

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With return on investment the focus of this event, it is only fitting that we honor the 1995 Enterprise Value Award winners at the Enterprise Value Retreat. If ROI has eluded you, learn from those who have made payback a reality for their organizations. Enterprise Value Award recipients will share both their war stories and their glory stories in their quest for ROI. The bottom line is that this event is a learning experience.

For more information, call 800 355-0246 or visit our Web site at *http://www.cio.com/conferences/enterprise.html.*

P.S. While on the subject of conferences, please join us March 17-20, 1996, at the CIO Perspectives conference, "The CIO and Cyberspace: The Business/Technology Intersection," in Naples, Fla. We will explore the executive's role in Web/Internet corporate initiatives. For more information, call 800 366-0246.

# Coming In CIO

## Government CIOs

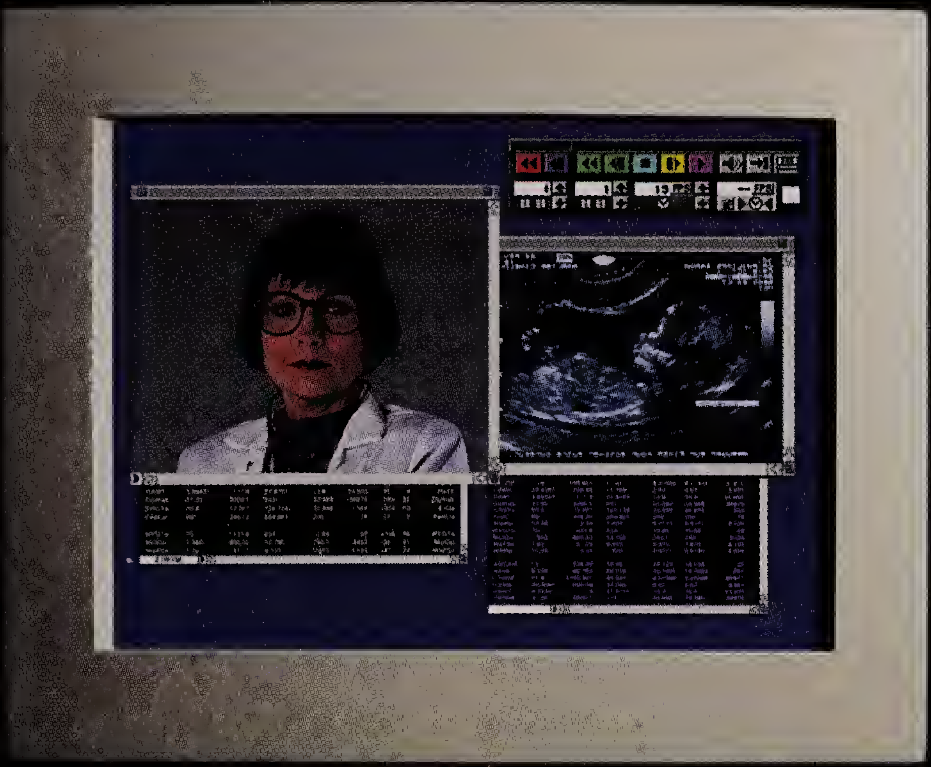
The U.S. Coast Guard is looking for a few good men or women as candidates for its first CIO. Find out why it feels the need for a CIO now and what that person's mission will be. *CIO* will also take a look at pending legislation to hire CIOs at all the major federal agencies in order to help solve the government's inherent problems managing its IT investment.

## Trafficking IT

To keep the buses on schedule, Maryland's Montgomery County has turned to on-board computers to manage traffic lights and let passengers waiting at bus stops know when the next bus is due. Los Angeles and Seattle have information systems that warn commuters of bottlenecks. And Atlanta has added a number of innovative technologies to handle the anticipated crowds for the upcoming Olympics. What's the latest in traffic management?

## "Marketspace"

Brand new markets are being carved out of the "information space" that could never have existed in the physical realm. Florida State University, for example, has created a system of "smart" ID banking cards that students use to pay for tuition, buy pizza and sign up for classes at ATM-like kiosks around campus. FSU sells access to this "marketspace" to local merchants, who pay FSU a percentage of the sales made to students. Students, in turn, like the convenience of not having to carry cash. Find out about some of the newest markets being created by computers.



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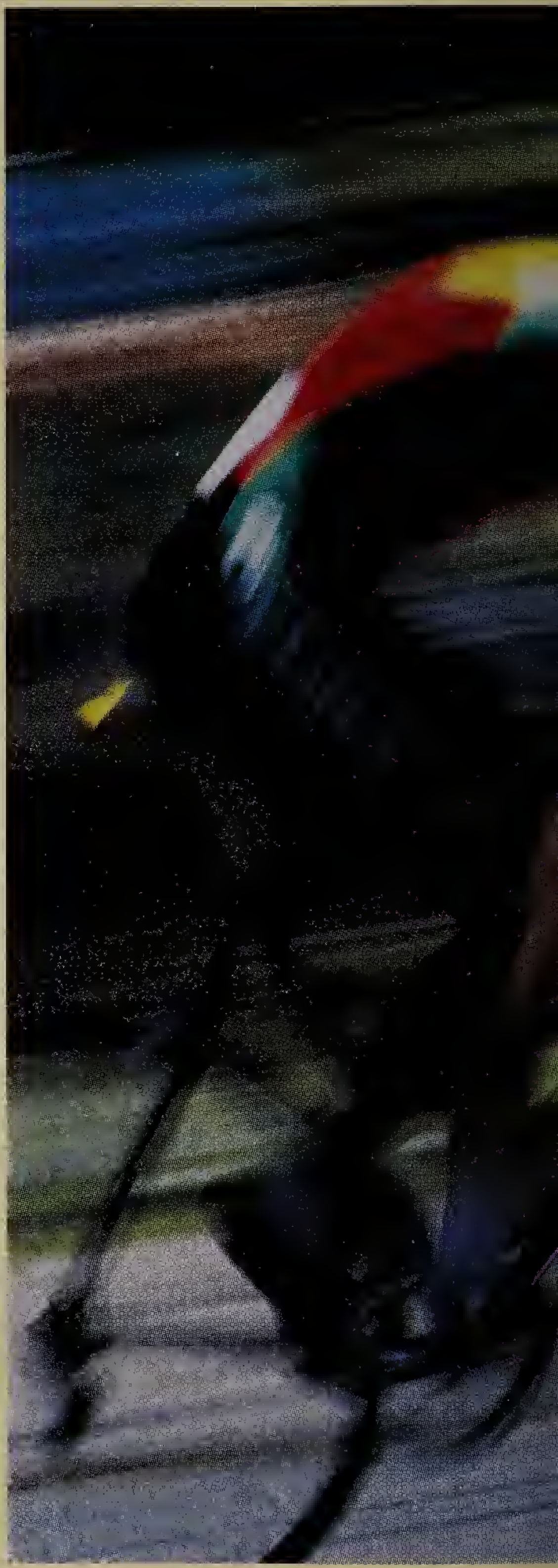

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**TELECOMMUTING**

## HOME ALONE FOR GOOD

If you've ever wondered whether humans really are social animals, consider what happens when we leave them home alone for a while. In a recent Georgetown University School of Business study of 130 telecommuters at several companies, researchers found that after an initial period of joy, telecommuters began to feel lonely, disconnected and fearful that they were damaging their chances for advancement.

The fear part, it turns out, is sometimes justified. Relations between telecommuters and their supervisors can suffer dramatically if conscious efforts aren't made to support both parties, according to Lamar Reinsch, a Georgetown professor who authored the study for Bell Atlantic Corp. in Philadelphia. Reinsch recommends training programs for supervisors to improve their ability to deal constructively with negative feedback from telecommuters ("You don't return my calls!") and display loyalty to employees who aren't in the office. Telecommuters, meanwhile, need to be pulled into the office regularly, whatever the pretext. "Companies that support full-time telecommuting need to create programs that bring the manager and the employee together, whether it is a formalized meeting system or just purely social," he says. "It refreshes the sense that there's a person on the other end of the e-mail channel."

As for the loneliness experienced by telecommuters, it is an inevitable part of the "adjustment to reality" that occurs after the seventh to 12th month at home, according to the study. "Everyone goes through it, no matter how well they're prepared," says Yee Jao, who manages a group of telecommuting business travel agents for American Express Co. Inc. who took part in the study. According to one employee's description, there are six distinct stages of adjustment to telecommuting, including initial bliss, increasing alienation (showering and footwear optional) and, finally, a kind of equilibrium.

Amex eases the pain of disconnect with its "buddy" system, in which telecommuters are paired with friends back at the office who keep them informed of gossip, intrigue and the boss's mood in return for the telecommuter holding down the fort remotely at odd hours. Telecommuters and

## CAR TALK

**Would you believe a technology that cuts down on the number of fender benders?**

**An optional cellular telephone offered by the Lexus Division of Toyota Motor Sales of Torrance, Calif., uses voice activation to dial stored telephone numbers and provides virtual hands-free operation. Because drivers just push a button on the steering wheel and give voice commands to place calls, they can keep their hands on the wheel—and their eyes on the road.**

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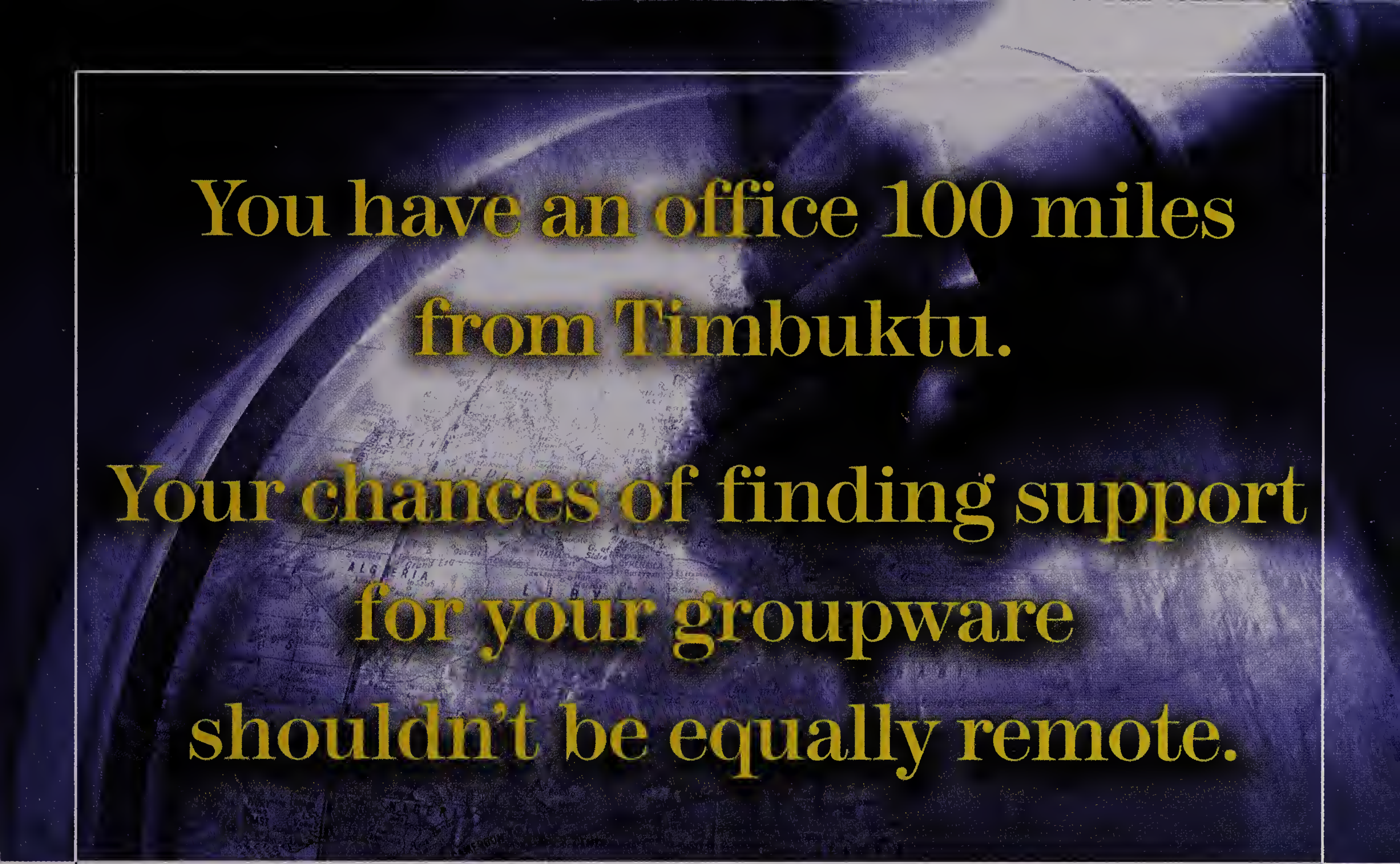

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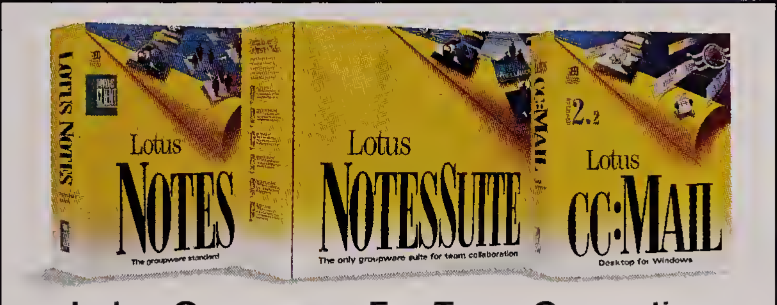

Lotus Groupware For Team Computing

buddies are both members of teams that meet either in person or by teleconference on a regular basis, both to maintain social connections among the larger staff pool and to keep alive the sense of shared purpose.

In the end, Reinsch found that the telecommuters in his study did not regret their choice: 83 percent said their home life improved and 73 percent believed their productivity increased. After a mutually supportive relationship with the manager, the most important keys to success seem to be telecommuters' high degree of self-sufficiency and easily quantifiable or performance metrics. Of the few telecommuters who expressed unhappiness, almost none are planning to return to the office, Reinsch says. They're simply looking for better telecommuting jobs.

*–Christopher Koch*

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## THE ACCESS ACCESSORY

**Remember your disappointment when the decoder ring that you got from sending in box tops was nothing but a piece of plastic? Now you can get one that lives up to its name. Dallas Semiconductor Corp., designer and manufacturer of CMOS chips and chip-based subsystems, and Jostens Inc., the Minneapolis-based outfit best known for school rings, have developed a digital Decoder Ring with an embedded silicon chip that can access personal computers and control entry to offices, laboratories and bank vaults.**

**Each ring is individually numbered and registered with a unique, 64-bit serial number permanently engraved in the chip. To access a building or computer, the wearer touches the ring to a preprogrammed probe so that the ring's chip communicates with computer system chips. Used in conjunction with Dallas Semiconductor's Priva-C software, computer files are impenetrable to all except the wearer of the ring with the right serial number. Personal identification numbers (PINs) are an additional security option.**

**The ring's chip contains 64KB of memory, roughly enough for a couple of pages of text or one digitized color photo. Dallas Semiconductor predicts that eventually the rings will replace magnetic strips used in ATM and credit cards.**

**Jewelry prices start at $59.50. Priva-C software costs $79 and includes the hardware probe. For additional information, contact Dallas Semiconductor at 214 528-9200 or at *http://www.dalsemi.com.***

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**COMPUTER LITERACY**

## IT MAKES THE GRADE

Most state colleges and universities expect at least some students to prove computer literacy before receiving a diploma, according to a recent nationwide survey. Others expect to add that requirement in the near future.

More than half the schools surveyed—58 percent—say students in certain programs must demonstrate mastery of computer skills to earn a degree. Twenty-one percent require computer literacy of all graduates.

And those percentages will grow rapidly, researchers say. "Over the next few years, there will be virtually no majors where students have little or no exposure to computers and other IT as part of their course work," the American Association of State Colleges and Universities wrote in its report on the study. In fact, the Washington-based organization says, "most disciplines will expect students to fulfill some computer competency requirement which addresses both discipline content and the technology applications employers will expect students to use once they are on the job."

The organization surveyed 250 four-year public institutions nationwide, ranging from large urban universities to small rural colleges. Respondents also answered questions about access to technology, faculty competency expectations, distance education, networking, managing and financing IT, and institutional goals and plans.

Smaller schools are more likely than large universities to expect computer literacy of all graduates, according to the AASCU report. The most common approach: a required "survey course" covering word processing, spreadsheets, database management principles and introductory Internet navigation.

Individual departments most likely to demand some type of IT competency include business, administrative science, teacher educa-

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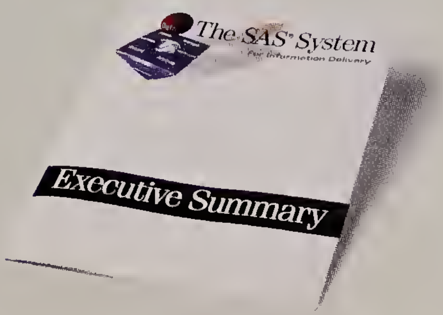

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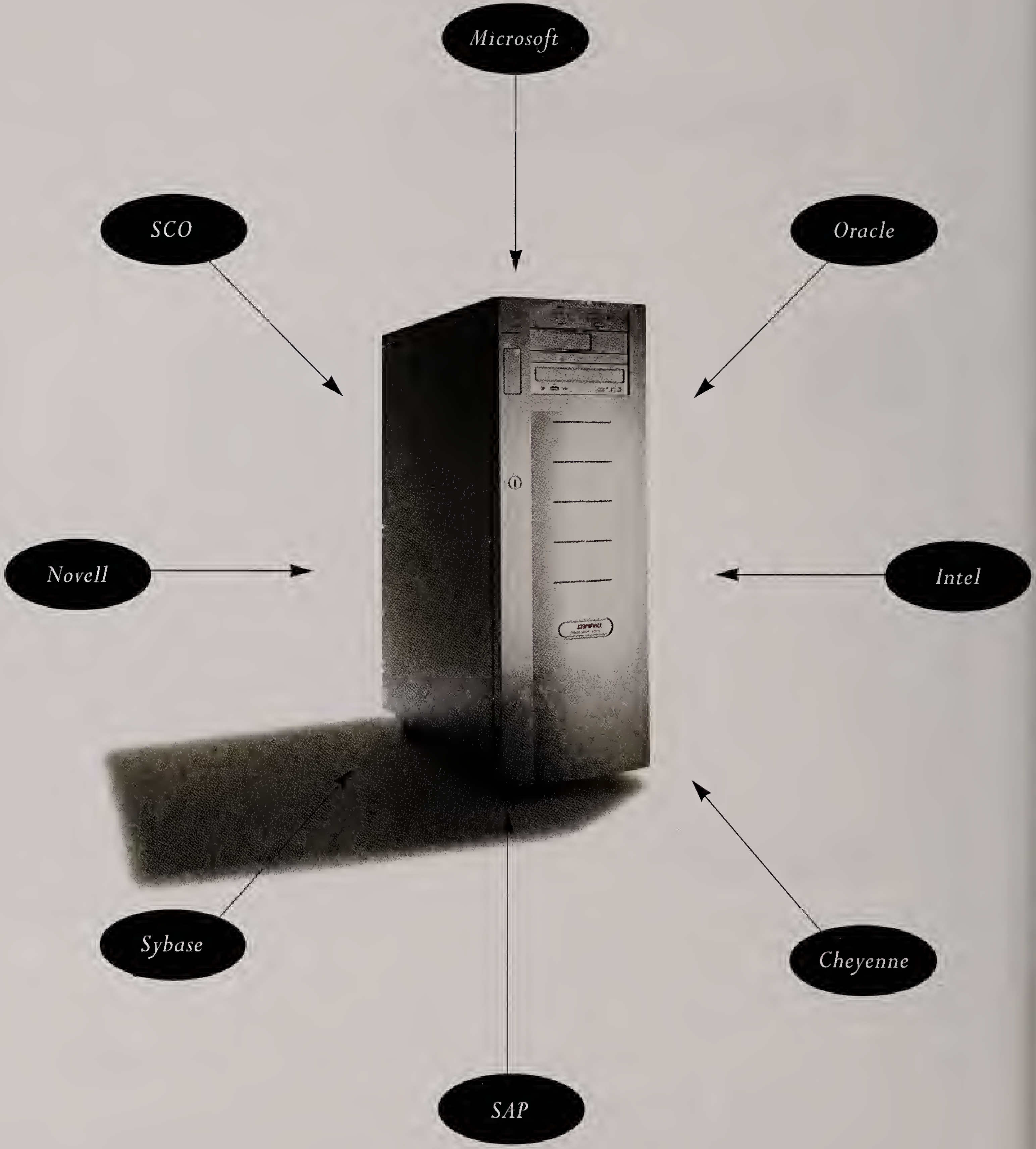

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tion, art, library studies, journalism, nursing and criminal justice.

Currently, few schools require incoming freshmen to demonstrate computer skills, AASCU says. That's because their IT know-how spans a very broad spectrum.

While most current college-age students received some computer instruction in elementary school, researchers have found many failed to maintain or upgrade their skills in higher grades, where other requirements and activities compete for their time.

"Once they're in high school, things fall apart," explains Meredith Ludwig, director of the office of association research. For that reason, many schools require an orientation to technology to make sure all students start from the same base, then leave specific professional training up to the departments in their major fields of study.

Less than 3 percent of the colleges and universities surveyed require students to provide their own computers. But 75 percent of large schools and 89 percent of small ones say they offer "sufficient" access to computers outside the classroom, mostly in general-access laboratories. While about half currently don't charge for computer use, 65 percent expect to levy special fees in the near future.

The downside: Overall, the schools surveyed have much lower computer-literacy expectations for professors than for students. Currently, less than a fifth have explicit IT competency requirements for instructors, although 75 percent offer computer-training workshops for faculty.

Among the survey's other findings:

- Public institutions consider telecommunications and

## RAPID TRANSPLANTS

**For 40,000 people in the United States currently waiting for organ transplants, time is of the essence. (On average, eight people die each day because organs are not available.) The problem is exacerbated by the time-consuming and complex process that pairs donated organs with recipients.**

**The United Network for Organ Sharing (UNOS), which administers the U.S. Scientific Registry for Organ Transplantation for the U.S. Department of Health and Human Services, teamed up with American Management Systems (AMS) of Fairfax, Va., to develop a system that saves lives by compressing the donation process. Typically, when an organ becomes available, officials at that hospital must call and fax information to several transplant centers, one at a time, based on a priority ranking of potential recipients. If an offer is declined, the process is repeated until a match is found. Each transplant center may take up to an hour to respond, wasting valuable time.**

**To address this problem, AMS and UNOS created Xpedite, an information system that electronically captures and rapidly distributes donor information to multiple transplant centers. Using the Xpedite system, organ procurement coordinators collect donor information on laptop computers and transfer it to the UNOS Lotus Notes servers, where a computer match system automatically generates a prioritized list of potential recipients. Coordinators can then contact transplant centers via SkyTel pager to alert them that a particular organ is available and where each patient is on the list. Transplant staff can dial into the Lotus Notes server to access donor information or use Lotus Phone Notes to request the data through a fax gateway. As a result, one coordinator can place multiple organs simultaneously, frequently reducing the process by several hours.**

**"Doctors, coordinators—everyone we spoke to in the transplant community—confirmed that the communications infrastructure was insufficient for handling the enormous amount of data necessary for donor placements," says Mike Titmus, AMS vice president. "UNOS's implementation of Xpedite significantly enhances the group's ability to communicate critical organ transplant information." Xpedite is scheduled to roll out to more than 800 transplant centers nationwide by the end of 1996.**

## FLEXIBLE FLIERS

**Flextime, the most common work-family initiative in U.S. offices, does not threaten career advancement, according to a recent study by The Conference Board. But part-time work can hurt you—43 percent of the corporate work-family program directors surveyed said it can damage chances of becoming a senior executive.**

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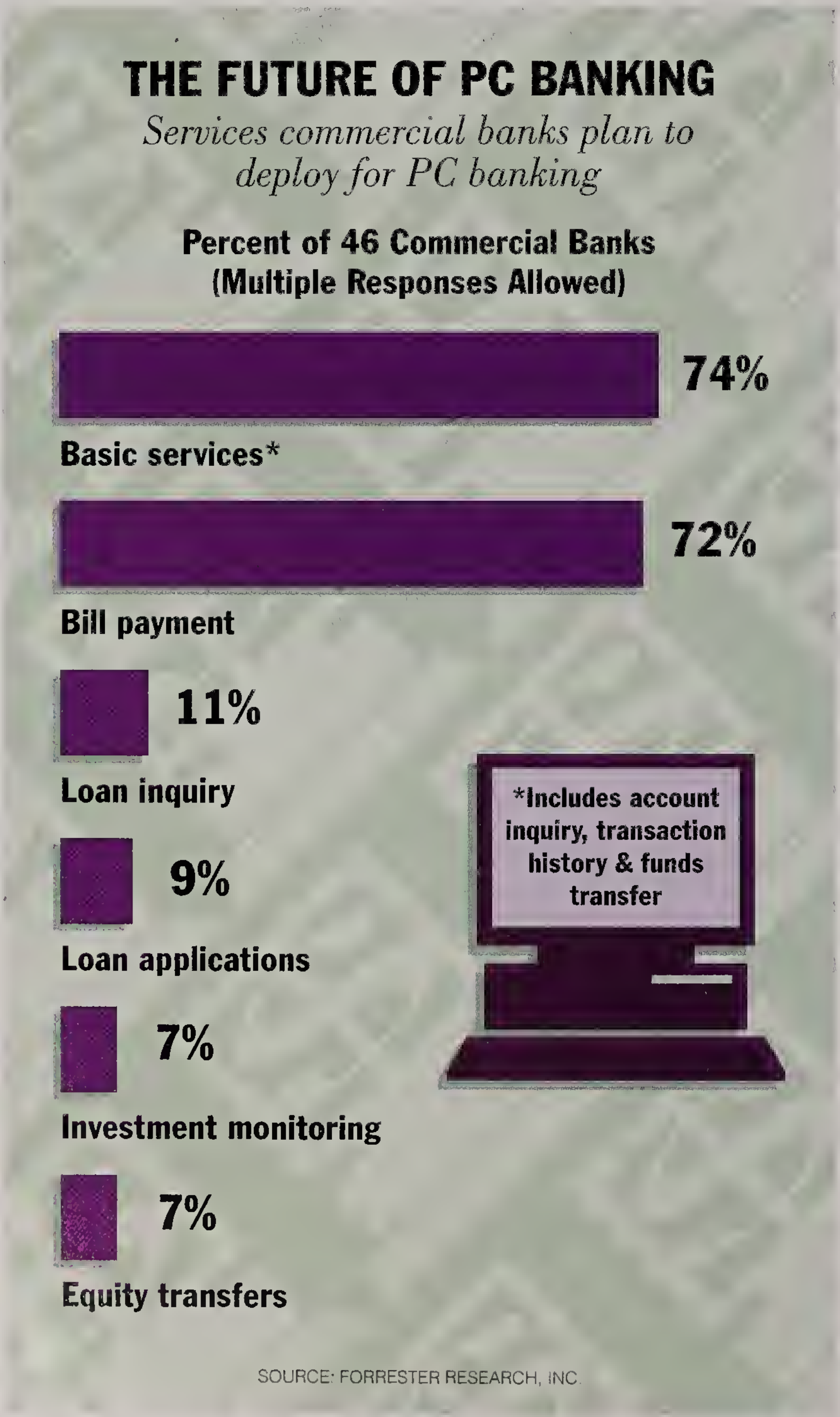
networking critical to campus life, with nearly all—99.5 percent—offering e-mail and 93 percent providing Internet access.

- Almost half the schools surveyed offer "distance education" by instructing students in remote locations via computer, cable TV or other technologies. But only 10 percent offer full degrees in the electronic format.

The survey concludes that, although public colleges' approach to IT varies widely, most are realigning their technology investments against their assumptions about mission, graduation requirements and faculty competency. "Institutions are on the brink of doing business differently," the report concludes.

Copies of "On the Brink," the association's report on the survey, are available from AASCU Publications, 1 Dupont Circle, Suite 700, Washington, D.C. 20036-1192. The cost is $10 for association members and $15 for nonmembers.

*–Anne Stuart*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This site contains hundreds of links to sites addressing such relevant topics as MIS research, BPR, organizational learning, complexity research, electronic commerce, journals and magazines, international business, companies and research, and jobs, careers and resumes. The links we followed lead to a wealth of incredibly rich, useful and interesting information. Check it out—it's definitely worth the trip.

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The Electronic Accountant costs $59 annually and requires a CD-ROM drive, version 3.1 or higher of Microsoft Windows, a 386 microprocessor at 25 MHz or better, 8MB of RAM or more, 4MB of free hard drive space, a VGA monitor and color monitor. Sound capability is recommended. Call 212 967-7000 for more information.

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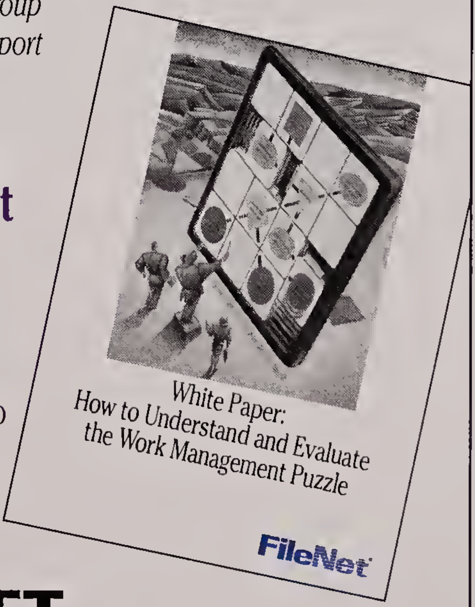

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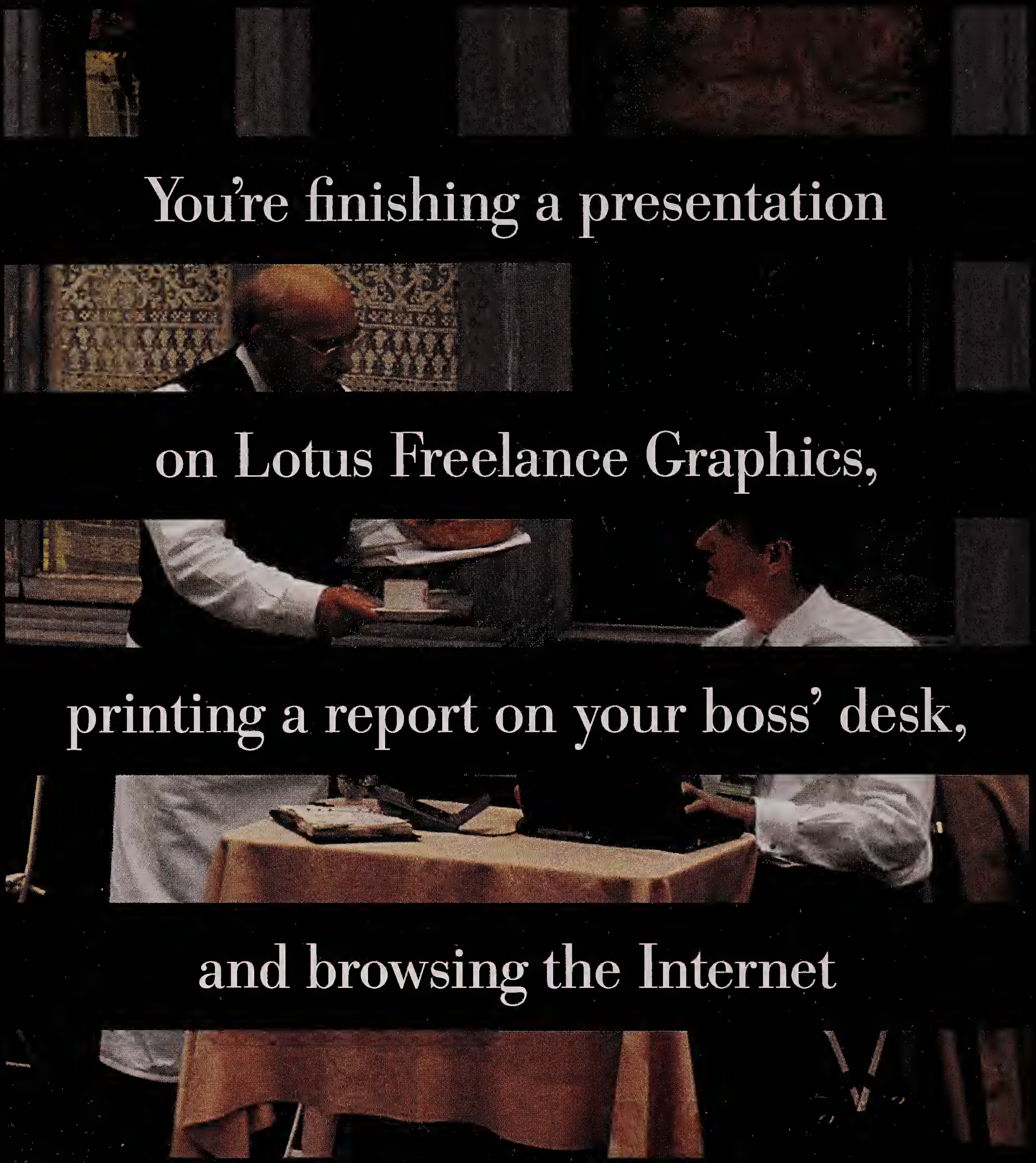
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# Elusive Assets

Meeting in Houston, business leaders address the challenges of managing knowledge

**BY ANNE STUART**

Managing knowledge requires nothing less than "radically changing our thinking about organization," in Margaret J. Wheatley's view. In fact, the author of *Leadership and the New Science* (Berrett-Koehler Publishers, San Francisco, 1992) says it requires embracing chaos.

Organizations err, Wheatley says, when they try to control knowledge—a natural, fluid, dynamic force—by shoehorning it into a rigid organizational structure. "In the new world view, messiness is a virtue," she told the recent Knowledge Imperative Symposium in Houston. "Life uses messes to get to orderly solutions."

But to embrace chaos and messiness is a pretty big leap for most executives. The champions of knowledge management in organizations today are therefore faced with the challenge of valuing and quantifying their intangible assets. "We need to bring rigor to this area," said Hubert St. Onge, vice president of learning organization and leadership development at Canadian Imperial Bank of Commerce (CIBC). "In the future, success will depend on management's ability to leverage these hidden assets."

These two views illustrate the breadth of opinion at the symposium, sponsored by Arthur Andersen and Co. and the Houston-based American Productivity & Quality Center. In opening the event, APQC Chairman C. Jackson Grayson Jr. noted that executives have traditionally interpreted the "knowledge is power" axiom as meaning they should protect their power by hoarding knowledge. He cited the event's strong attendance—510 participants, from as far away as Korea—as testimony to a growing international interest in sharing knowledge for competitive advantage.

In human organizations, as in nature, chaos prompts the maximum amount of information, Wheatley said. "As we seek to control things, we are limiting information." Acknowledging that most companies can't operate in chaos, she suggested instead living on the edge by creating an environment with enough fluidity to allow easy information flow and enough structure to capture knowledge.

That balance requires "only a few rules, some specific information and a lot of freedom," she said. To achieve it, executives must relinquish some control, accept chaos and change as part of the process and realize that if they provide the information, order will naturally follow. "Self-organizing systems can change and adapt all the time because they have access to the intelligence that exists everywhere within them."

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More than one speaker echoed the message that to manage knowledge effectively, organizations must shift their focus from tangible to intangible assets. Large American corporations "are very good today at getting costs down," said Edward E. Lawler III, director of the Center for Effective Organizations at the University of Southern California business school. "I'm not so sure they're good at innovating."

Tracking and copying the competition won't help companies get ahead, Lawler said. "In fact, you'll be at a competitive disadvantage because you'll be doing what they're doing, and not doing it as well." Instead, companies should remain flexible enough to develop unique offerings and push forward with them. "The challenge is to create an organization that learns and develops capabilities that create competitive advantage," Lawler said.

Chevron Corp. Chairman Kenneth T. Derr agreed. "Managing knowledge today is something we will all have to master to survive in a global economy. Those who use and manage knowledge—with the emphasis on use—will do better than those who don't."

> **More than one speaker echoed the message that to manage knowledge effectively, organizations must shift their focus from tangible to intangible assets.**

At San Francisco-based Chevron, executives guide knowledge management with "the Chevron Way," a document combining the energy and chemical company's mission and vision statements and its commitment to other principles such as teams, total quality management and environmental protection. "It provides the basis for alignment for our whole organization," Derr said.

Effective knowledge management starts at the top, according to Derr. Executives must promote strategically, support the total enterprise, encourage "upward feedback" and "maintain a steady and visible level of enthusiasm" for knowledge management.

Above all, he said, they must share best practices throughout the enterprise. "If we don't do it, a lot of other companies out there are doing it—and they will pull ahead."

To ensure free-flowing information, global companies must not only remove barriers but reach across

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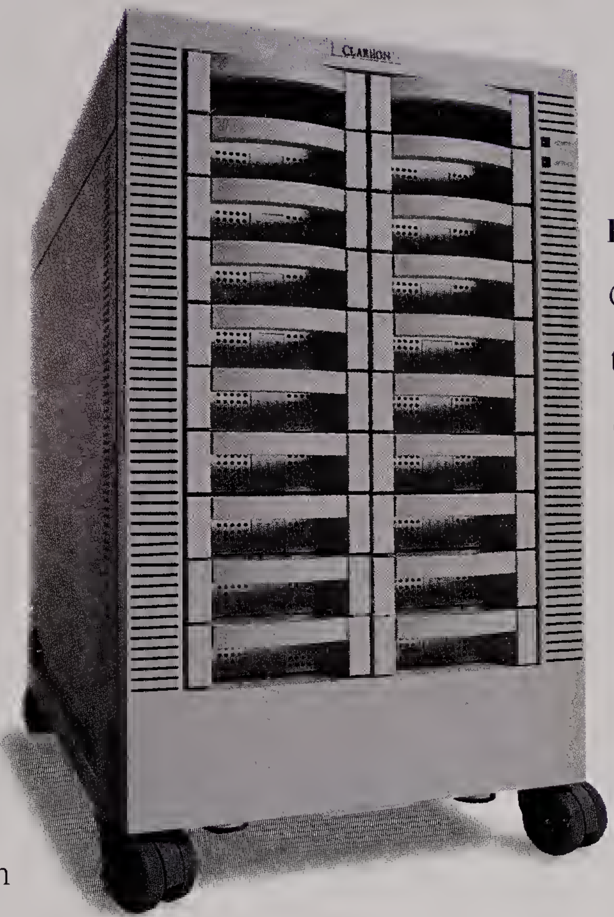

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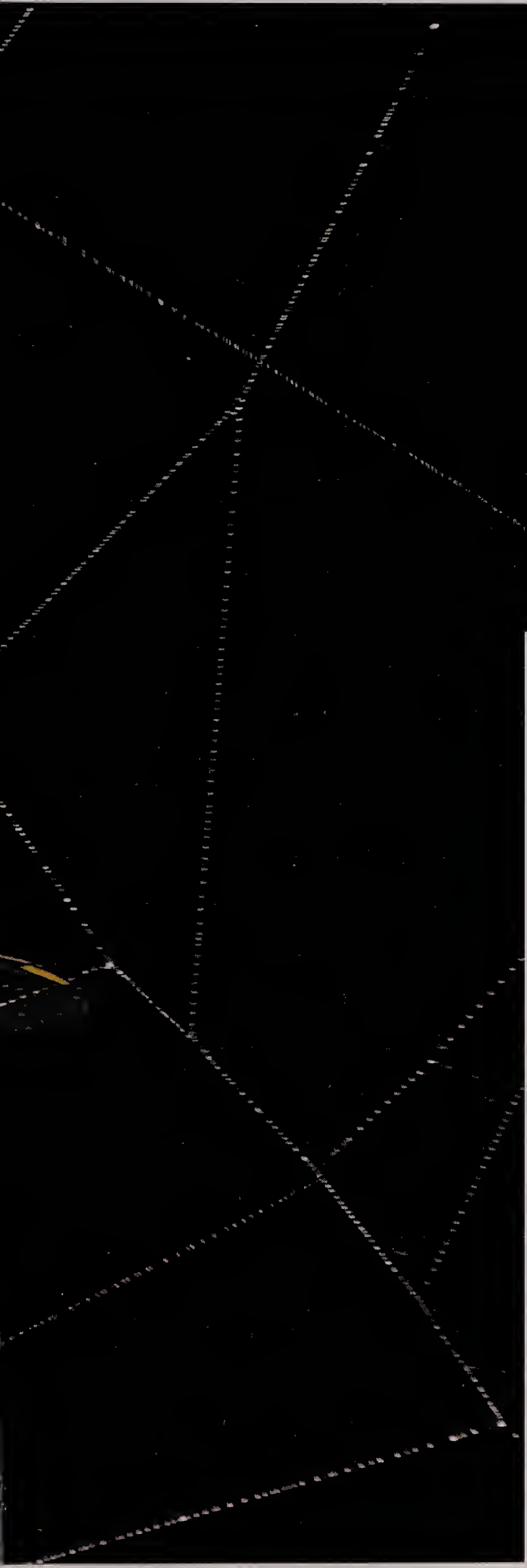

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cultural borders, several speakers said. Doing that means building "a community of people who trust each other," said Robert H. Buckman, chairman and CEO of Buckman Laboratories International Inc., which conducts business in 90 countries. For example, the Memphis-based company gives all employees a wallet-size card carrying the Buckman code of ethics in 10 languages. "That's the glue that holds us together as a community of individuals," Buckman said.

Knowledge management presents similar challenges in highly decentralized companies, several speakers noted. Browning-Ferris Industries Inc. (BFI) wanted to manage knowledge resources consistently in its 500 largely independent district offices, said Chairman and CEO William D. Ruckelshaus. As it acquired other companies, the Houston-based waste disposal firm also wanted to find ways to assimilate its new employees' knowledge.

As part of a companywide restructuring, BFI began using structured "breakthrough" teams at the district level. The cross-functional project teams, consisting of five to 10 frontline employees, must implement solutions and achieve results in eight to 10 weeks rather than producing studies, ideas or recommendations for later implementation. The intensive schedule and emphasis on performance has taught BFI employees "to tap the knowledge of their co-workers every day," said Ruckelshaus, whose resume includes stints heading the Environmental Protection Agency and the FBI. By quickly using that collective knowledge, he said, teams have boosted BFI's bottom line and improved customer service.

But too much knowledge can be a dangerous thing, warned economist Gary Shilling. "Ironically, the more information is available, the less it's worth," said Shilling, who heads his own Springfield, N.J., firm, A. Gary Shilling & Co. Inc. And while IT advances increasingly help disseminate information more widely, cheaply and quickly, that's not always an advantage, Shilling said, citing the global panic that fueled the 1987 stock market crash after early reports of declining values.

In fact, IT is only "somewhat useful" in managing knowledge, said Thomas H. Davenport, director of the Information Systems Management Program at the University of Texas at Austin and columnist for *CIO*. Technologies such as Lotus Notes or the Internet's World Wide Web won't help much with knowledge management unless they're strongly linked to people and processes. "Knowledge dies when it is disembodied," he said.

> **While IT advances increasingly help disseminate information more widely, cheaply and quickly, it's not always an advantage.**
>
> *–Gary Shilling*

Davenport predicted that organizations serious about knowledge management will appoint a senior executive—perhaps with a title such as "chief knowledge officer"—to oversee their intellectual resources.

Among the first known people to hold such a title is Leif Edvinsson, who since 1991 has been director of intellectual capital for Skandia AFS, a Stockholm-based insurance and financial services company. It's no accident that Edvinsson's title pairs knowledge and money; the company's president has publicly called Skandia's knowledge base as critical as its financial assets in providing sustainable earnings. "The most distinguishing factor in moving into the 21st century will be intellectual capital," Edvinsson told the conference.

"But there's a value paradigm I think we miss if we just think of financials," he added. "The issue is not to make money but to make meaning. That is why we have the focus on renewal and development [of knowledge]."

CIBC's St. Onge agreed. "Accounting can no longer serve as the basis for managerial accountability." St. Onge divided the enterprise into three asset groups: intangible assets, which include technical knowledge, customer loyalty and business processes; tangible assets; and financial capital. He argued that the only route to financial capital is through customer capital (an intangible), yet tangible assets receive most of the attention, and "professional managers are tied to the spreadsheet."

As always, the conference generated plenty of semantics. Some argued that it was counterproductive to talk about knowledge "management"—that it is too restricting a term. Edvinsson called the learning organization obsolete, saying it yields only half an answer to the question of how to best manage knowledge and neglects to deliver any value added. What organizations need are "intelligent" organizations that focus on both learning and teaching, he said. Competitive advantage goes to organizations that reduce the turnaround time between those activities, and IT can help close that gap.

Arian Ward, leader of Learning and Change at Hughes Space & Communications Co., has developed a system to accomplish that goal with his Lessons Learned architecture. This is a methodology for capturing, analyzing, editing, sharing, learning and putting into practice the knowledge of all employees.

There was little dissent at the conference regarding the value of intellectual capital and knowledge-based activities. The employee of the future "can function anytime, anywhere," said Buckman. "Any person can contribute to solving any problem." The tough question for all companies is, "How do you organize around that?" CIO

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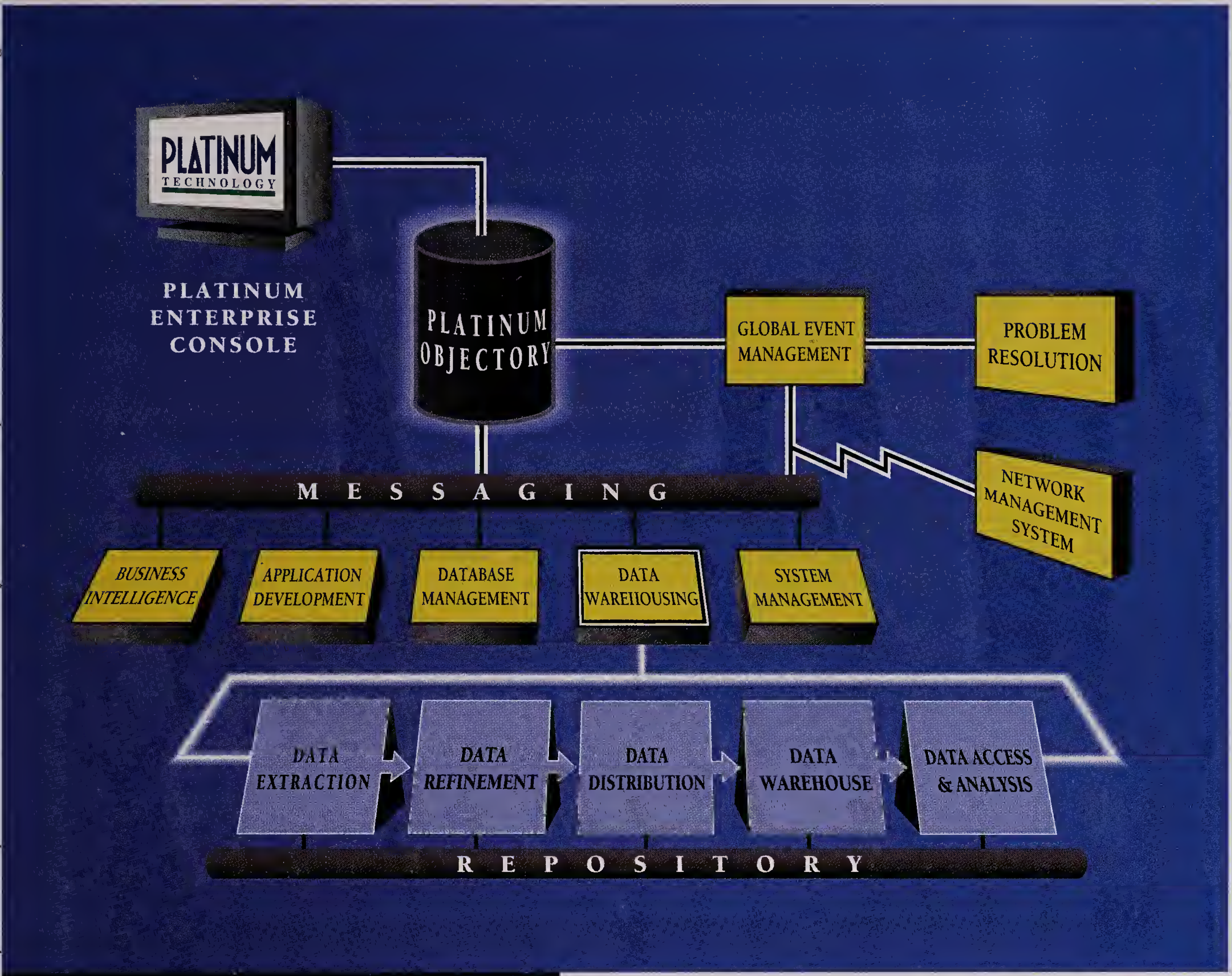
*Anne Stuart can be reached via e-mail at* astuart@cio.com.



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# Think Tank

## BY TOM DAVENPORT

### *The Virtual and the Physical*

**FOR YEARS, I AND MANY** others have been arguing that in the context of reengineering, information technology makes geography irrelevant. With worldwide networks, processes can be distributed around the globe. Products can be designed in multiple locations, manufactured in others, sold in still others. Geography has been replaced by virtuality.

The most recent version of virtual thinking involves the elimination of offices. In researching this phenomenon, University of Texas colleague Keri Pearlson and I have found that about a third of the Fortune 100 have eliminated offices for some workers, particularly the sales force and field service functions. The information technology industry has been particularly aggressive with virtual offices; IBM, HP, Digital, AT&T, Intel and Xerox have all replaced some offices with technology. (Of course, most of them are using their own products and services and trying to set a good example for their customers.)

Most virtual workers like the autonomy, the ability to mix work and family, the absence of a regular commute. They like working at home, particularly those who don't do it every day. Senior managers also like the idea; to them it means lower real estate bills (33 percent reductions for some firms) and more "face time" with customers. Middle managers and front-line supervisors are not so positive—sales managers, for instance, wonder how to motivate salespeople when they never see them—but nobody's losing sleep about the discomfort of middle managers these days.

**PHYSICAL VIRTUES**

**When National Semiconductor began to transfer semiconductor fabrication technology from one plant to another, it found that one predictor of the success of such transfers was how long the receiving plant's engineers spend in the same location with the providing plant's engineers.**

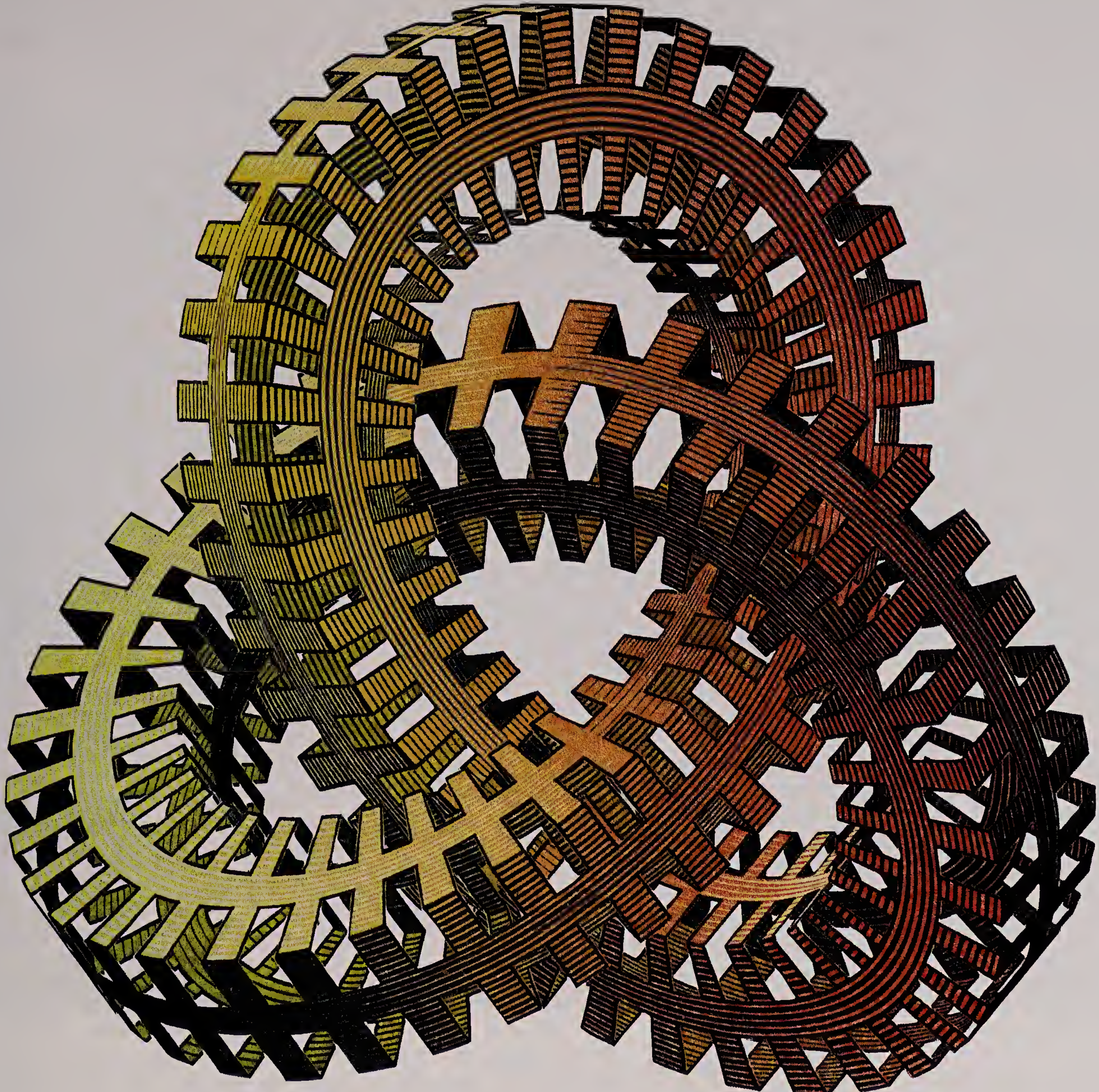
But there is a definite dark and little-discussed side to virtuality. A Cornell University survey of IBM virtual office participants hints at the problem. Seventy-seven percent of the respondents reported that "professional communication at work" was somewhat or much worse; 88 percent said that their ability to socialize with co-workers was worse or much worse. The fact is, we don't communicate well in virtual environments.

**PHYSICAL VIRTUES**

**Chrysler's success in new-car development is due in part to the co-location of almost all process participants in the Chrysler Technology Center, its managers say. Ford, which is attempting to design cars globally by dispersing the process around the world, found it necessary to bring all the players together for several weeks to develop face-to-face relationships before they could work well electronically.**

These findings shouldn't come as any great surprise. Researchers have been telling us for a while that face-to-face contact matters in business. "Let's get physical" is as valid today as when the immortal Olivia Newton-John first uttered the words (see boxes). MIT researcher Tom Allen has given us "The Forty-Foot Rule." Among scientists and engineers, the probability of two people communi-

PHOTOS BY WYATT MCSPADDEN



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cating during a week drops to virtually nil if their offices are more than about 40 feet apart. If they're on different floors, forget it. One might expect that nontechnical people would be a little more likely to venture outside their cubicles for human contact, but surely even they find it hard to keep up with people in another building or on another continent. Other business researchers have found that a network of trust must precede any online network; in order for a virtual project to work, employees must have first established a face-to-face relationship.

### PHYSICAL VIRTUES

**Seagate**, a disk-drive manufacturer, relocated its manufacturing facilities to the Far East in order to lower costs. Two Harvard Business School students, Andrew Bartmess and Keith Cerny, discovered that because Seagate's design engineers were unable to communicate easily with manufacturing, new-product development speed dropped markedly, along with revenues and profits.

Having an office doesn't just give us a place to sit; it's also a place to get socialized into the culture of the company. Observing the behavior of other workers and having casual conversations with them is how we learn "the Acme Corp. Way." With the rise of downsizing and the fall of jobs for life, we have precious few reasons to be loyal to our firms today; if we have no physical space to call our corporate home, we have one fewer.

So, if you don't want to invest the time and money to make sure that your company's social networks flourish in a virtual world, add a few more don'ts to the list. For starters, don't expect that your virtual sales force will pass on a lot of customer feedback about that new product. Don't expect that virtual design engineers will chat informally with virtual manufacturing engineers. Don't anticipate a lot of information exchange between virtual customer field service and virtual product development on the maintenance problems with the new model. And don't expect employees who spend eight to 10 hours a day selling (or creating or interfacing with customers) to hop onto Lotus Notes at 10 p.m. to record their observations for use by the rest of the company. All that mobility takes energy, and they're probably in bed by that time.

### PHYSICAL VIRTUES

**Xerox** failed in an attempt to make its copier repair personnel virtual by providing them with laptops and CD-ROM-based documentation. Researchers from Xerox PARC discovered that copier service engineers learn not from documentation (online or otherwise) but rather from exchanging stories face to face with their colleagues at coffee breaks and lunch. The plan to eliminate these in-office gatherings was hastily abandoned.

**SO HOW DO WE MANAGE** the trade-offs between virtual and physical? Who is responsible for information flow in this here company anyway?

Well, nobody else raised a hand, so it must be your job. When your reengineers plan the rollout of virtual offices and the dispersal of business functions, think carefully about how both electronic and verbal information will flow between people who need to talk. When the new corporate headquarters is being designed, help the architects think carefully about who needs to be within 40 feet of whom. The building that houses 3M's Austin division is designed so that no desk is more than a five-minute walk from any other.

If virtuality is a given, look for opportunities to create physical contact as often as possible. Have a weekly meeting—rent hotel space if need be. Get Starbucks to sell lattes in your lobby. Create satellite office space in the 'burbs. Make sure that front-line managers get training in "managing remotely," as one Hewlett-Packard course is called. Point out to sales managers that virtual assignments should be given to workers who have been at the company for a while and who are natural communication hubs.

Remember that it's human communication that turns data into information and knowledge. If your workers are virtual, data does them much less good. Will Pape, the CIO at VeriFone (a credit transaction equipment company that is truly independent of geography), lives in Santa Fe, where there are no other corporate facilities. Every day, he writes an information summary of key events, financial achievements and corporate developments and beams it out to the VeriFone world over e-mail. Pape believes that in such a dispersed organization, information providers must constantly seek to add value to data through context, interpretation and filtering. When we can't ask the controller down the hall why the cost of goods sold was up last quarter, someone else has to provide the information.

### PHYSICAL VIRTUES

**Steelcase** conducted an experiment with two new-furniture development teams. One was co-located with manufacturing and marketing personnel; the other was isolated in a separate facility. Both teams finished their designs at the same time, but the integrated team got its product manufactured and to market six months faster and at lower cost.

Virtuality is here to stay, but so is our need for physical interaction with other humans. The best information environments will take advantage of the ability of IT to overcome geography but will also acknowledge that the highest bandwidth network of all is found between the water fountain and the coffee machine. CIO

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*Thomas H. Davenport is a professor and director of the Information Management Program at the University of Texas in Austin. He welcomes reader comments at:* Tdav@notes.bus.utexas.edu.

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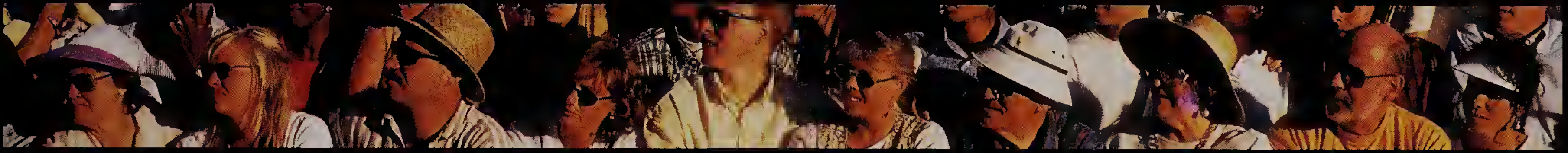

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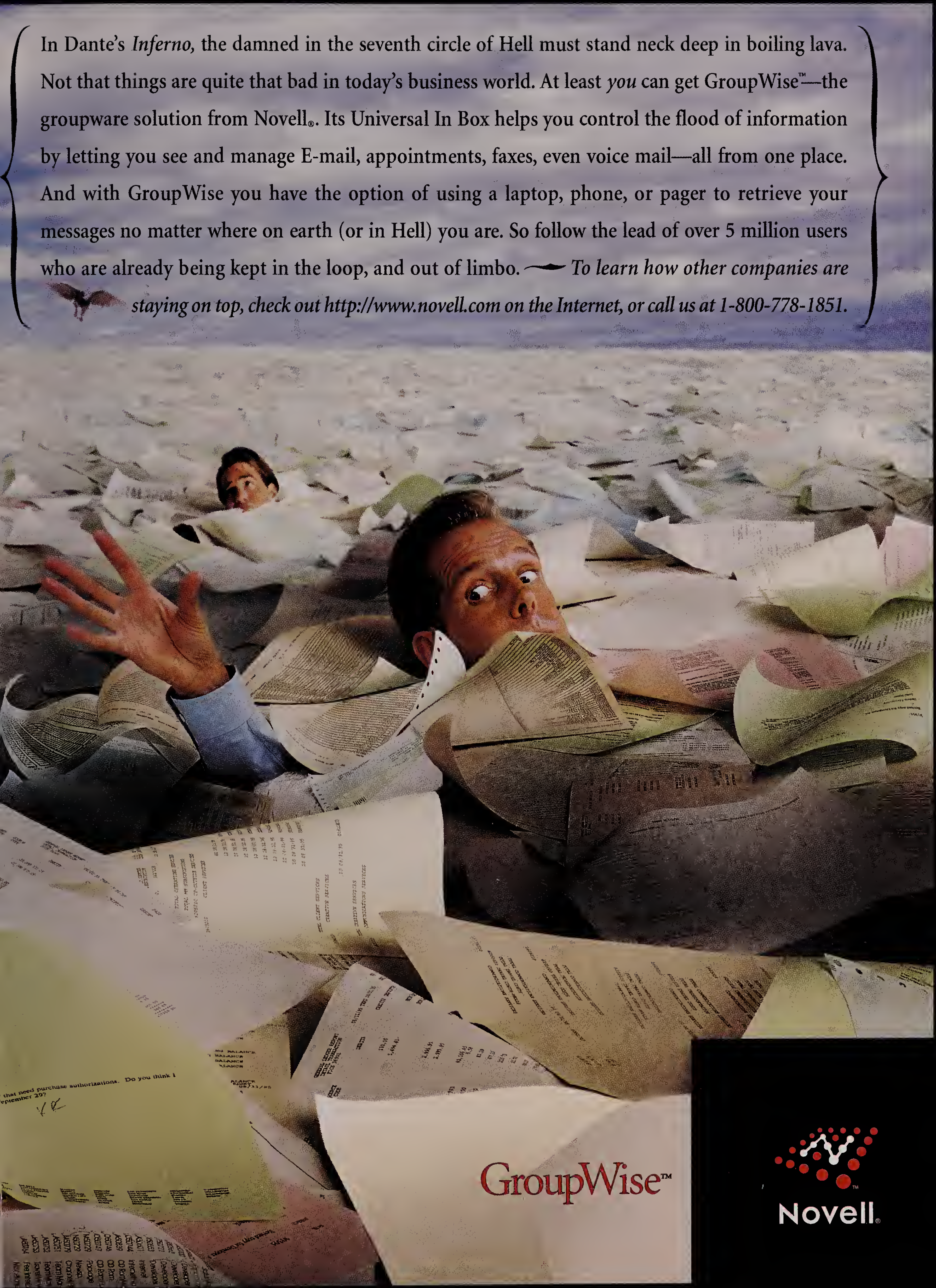

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# An Ev

**As you leave Route 1 and cross the rusty green bridge into Bath,** Maine, the first thing you see are the red-and-white-striped hoisting cranes emblazoned with the "BIW" moniker looming high above the skyline. An early morning mist is rising from the waters of the Kennebec River, so you must go slowly to avoid the hoards of hard-hatted, steel-toed pipefitters, electricians and welders streaming into the narrow main street that curves along the coastal river.

This scene may appear anachronistic to the so-called knowledge workers of the '90s, but for the metalworkers at Bath Iron Works Corp., it's just another day of cutting and pounding massive sheets of steel into the shape of Navy destroyers. Just another day, too, for a cadre of information systems professionals, who don hard hats, safety glasses and earplugs whenever they leave the quiet of their waterfront offices to visit their manufacturing clients amidst the din and roar of BIW's main assembly building.

The noise these days, as for most IS shops, comes from the clients, and it has been getting louder. Over the past 10 years, personal computer systems have sprung up like dandelions, largely unbidden and unplanned, scattered throughout the sprawling 55 acres of engineering, fabrication and planning facilities. Meanwhile, one big IBM mainframe continues to hum in the management systems building, doing 80 percent of the company's systems work—from payroll to materials scheduling to financials.

In the middle sit nearly 200 programmers and systems managers, trying to cope in a mainframe world gone client/server. But like the winding Kennebec, this information systems story has its own unique twists and turns. And where this tale will end remains as unclear as the murky, muddy bottom of the riverway.

# en
# Keel

The Cold War spending boom and subsequent bust left Bath Iron Works with lots of desktop systems and no easy way to access mainframe data. Will a top-down edict and a connectivity strategy help the shipyard steady its course?

BY E.B. BAATZ

**ON THE WAYS:** *The USS Hopper, named for Cobol inventor Rear Admiral Grace Hopper, has become something of a mascot to the IS group at BIW.*

**Let's begin in 1984 when, on the heels of a $25** billion construction program for the Ticonderoga-class guided-missile cruisers, Congress approved funding for the Arleigh Burke class (DDG-51) Aegis destroyer. Bath Iron Works won the contract, split with Ingalls Shipbuilding of Pascagoula, Miss., a division of Litton Industries Inc., to build five to six of these $900 million, 8,300-ton surface combatants each year. Employment soared at Bath, from 6,000 workers to a peak of 12,000 by 1989.

Along with the influx of workers came an unheralded spending spree, just at the time when an explosion of PC products hit the market. So, new computer technology mushroomed throughout the company. "We have one of everything ever invented," says Paul E. Mayotte, director of information systems. "An IBM 3090 500J mainframe that serves 2,000 clients, 1,500 networked PCs on a Novell LAN, at least 50 servers including 26 Unix servers, an HP CAD system, a Sun SPARC 10, a Prime antique and a Wang."

**PAUL MAYOTTE** *(l.)* *and* **JOHN STOY** *review plans in the assembly building.*

Paradoxically, at the same time that distributed computer systems were sprouting up on the shop floor, Bath's senior managers were struggling to use mainframe technology to manage production planning more effectively. In 1985, just as Intel Corp. was introducing the first 386 microchip for PCs, Bath Iron Works was starting a pilot project for an integrated materials requirements planning (MRP) system on its mainframe computer system. (MRP is a management system intended to help manufacturers plan and schedule parts and materials needed in production. For more information about MRP, see *CIO*'s Web site at *http://www.cio.com.*)

By 1987, Bath began implementing the Navy's MRP software called AMAPS/G. Yet, within two years, the system was deemed a failure and abandoned. The reasons for the failure were complex, but, says one BIW manager, "the technology just wasn't there yet."

Meanwhile, IT continued to evolve rapidly, and more new computer systems were percolating throughout the shipyard. The onus was on management to figure out how to manage the mix of legacy systems and new technology. While the power and flexibility of distributed computing was alluring—and the need to keep up with the Navy's IT advances critical—BIW wasn't in a position to completely relinquish the stability of the mainframe world. "Because the life cycle [for building a ship] is five years, [we felt] it could be disruptive to change our technology too often," says Thomas J. Egan, vice president of production planning, materials and information systems. "But when we looked at the numbers [in] 1988 and 1989, we could see we needed to make some information technology changes."

By the early 1990s, the pull between the mainframe orthodoxy and client/server systems hodgepodge was starting to take a heavy toll on the IS department. Information systems directors were coming—and going. In fact, between 1989 and 1995, five

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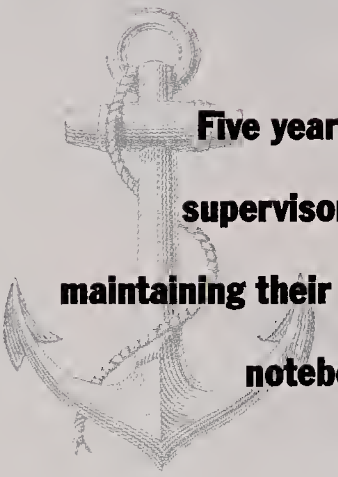
different directors had tried to handle the IS mess and had backed away either willingly or unwillingly.

Enter the information technology strategist: John Stoy. The bespectacled, thoughtful Stoy had watched a lot of Bath's IS turmoil from the inside. Since joining the company in 1985, Stoy had been an observer and then a player in the attempts to implement an MRP system on the mainframe. He had also worked closely with both Egan and Mayotte.



**Five years ago, some BIW production and planning supervisors still eschewed computers altogether by maintaining their materials schedules on little spiral-bound notebooks that they kept in their shirt pockets.**

And unlike old-fashioned IS professionals wedded to mainframes, Stoy had a long-standing interest in personal computers; in the early 1980s he briefly ran a startup business building and selling no-name PC clones. So, he had some insights into how the proliferation of distributed PCs was affecting the IS department and the business.

In the systems group, the list of woes seemed never-ending—high development costs, increased application and network maintenance, inability to guarantee integrity and security, and problems with data synchronization. For the fundamental business of building ships, the list of consequences was short but significant: missed schedules and higher costs.

BIW's problems with its integrated MRP system simply illustrated the two big stumbling blocks hindering effective information management: entrenched attitudes and lack of technology coordination. A change in the corporate culture with the entrance of a new chief operating officer would take care of the people problems while Stoy developed a connectivity strategy to tackle the technology troubles.

## Paperless Chase

A digital repository for technical drawings is helping BIW clear its decks of paper

**AL BELLOWS** *and* **SHELLEY HODGSON:**
*paper cutters*

**Bath Iron Works' destroyer planning** yard is responsible for planning and managing maintenance and upgrades for every Aegis destroyer in the U.S. fleet over the course of its 30- to 40-year life span. And in the three-year period of logistics planning of materials, labor and technical specs that precedes each docking, lots and lots of paper gets shuffled.

Vast repositories of paper drawings and microfiche punchcard replications of complex technical plans have long been a staple of the planning process. And the planning yard's paperwork accounts for just a fraction of the entire shipyard's paper-laden vaults. "Three years ago, BIW produced 166 million pieces of paper per year," says Edward M. Groner, manager of the shipbuilder's CALS (continuous acquisition and life-cycle support) program. "Internally we've reduced this to 36 million today, but Aegis-community papers that are still circulated around Bath number 75 million."

Now, Groner and partners Al Bellows, IS manager for the planning yard, and Shelley A. Hodgson, manager of engineering and production-related IS, as well as systems people in the Navy, are all working to diminish the paper chase. Through a pilot project sponsored by the Naval Sea Systems Command, BIW is attempting to create a digital drawing repository and provide remote access to the data. "I'm trying to change the way drawings get on to the system...to convert the film images to digital images," says Groner.

A year ago, in compliance with the Navy's JEDMICS (joint engineering data management information and control system) initiative, Bath's planning yard installed a Silicon Graphics server, an Oracle database and a Kodak optical jukebox. Wide-area access to the drawings is being tested now at Navy bases in Norfolk (Va.), Pearl Harbor, Washington and the San Diego area.

"We're in the process of a cultural transition," says Bellows. "The planning yard has access [to the digital drawings], but we haven't rolled out to the waterfront yet." The problem, says Groner, is not technological. "It's a process," he says. "I have to persuade, impress and cajole people into this new technology, but I cannot press them." *–E.B. Baatz*

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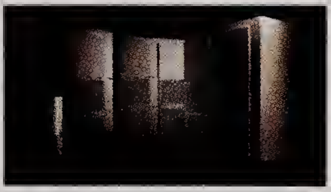

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**ALLAN CAMERON** *(l.) and* **THOMAS EGAN:** *Materials availability climbed from 94 percent to over 99 percent.*

## Lessons Learned

*Lest you think it was easy, here are some lessons that BIW's IS managers say they learned about implementing changes in the running of an IS shop:*

- Recruit the harshest IS critics to head up new technology projects.
- Make end users aware of application development trade-offs.
- Reward breakthrough performance with merit raises.
- Prove the concepts with early small successes and then market these successes back to the business.
- Get feedback from the business units, but use outside evaluators (consultants, academics, vendors) for a reality check.

## ≈ Banishing Bad Attitudes ≈

For Bath Iron Works, the shift to an integrated materials planning process necessitated a large cultural change. Not more than five years ago, some production and planning supervisors still eschewed computers altogether by maintaining their materials schedules on little spiral-bound notebooks that they kept in their shirt pockets.

"The system [of getting materials to production] was ad hoc and not integrated before MRP," explains Stanley C. Weliever, director of integrated manufacturing. "The electricians had their own plan that optimized their work without regard to pipefitters, and the idea to optimize the entire process was foreign to us. We had to beg, borrow or steal information from all of the crafts to see if [a task in the shipbuilding process] was done."

The company persisted in trying to implement a resource planning system on the mainframe. By 1994, three vice presidents—Jeff Geiger of engineering, Jay Bailey of manufacturing and Egan—were leading the charge on yet another in a string of attempts to get an MRP system up and running. This time the company would try Andersen Consulting's work-order management system called MAC-PAC/D, which would run on the IBM mainframe in an IMS nonrelational database language.

But managers weren't buying into the canned MRP reports. Instead, some continued to maintain their own databases on the shop floor. Others pleaded for special downloads of data from the mainframe so that they could do their own analysis on PCs, cutting and slicing work order, inventory, lead time and scheduling data to suit their individual departments' needs. As a result, managers from engineering, purchasing and production planning were having difficulties reconciling each other's data.

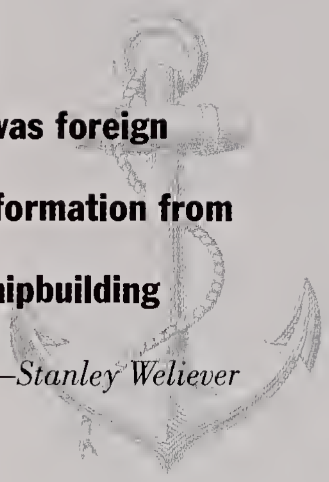
"I spent two and a half months trying to figure out a back-order problem with Pat [the purchasing director], but we didn't speak the same language," says John A. McCarthy, director of production planning, who oversees warehousing and gets materials to the mechanics when needed. Patrick S. "Pat" Thomas, director of procurement for BIW, explains, "Purchasing people were looking at catalog numbers, production looked at work-order numbers and engineering looked at part numbers. We were all counting different things." To straighten out even simple problems, "we'd chase our tail, analyzing every bit of data and hoping we'd find the answer," says McCarthy.

"The user community's faith is about this deep," says Weliever, squinting and holding his thumb and forefinger about an inch apart. "If [the MRP system] loses credibility because the data is out of date or inconsistent, then the old systems spring up informally immediately." In short, the third MRP implementation was on the verge of dying.

Then, in mid-1994, the company hired a new chief operating officer from submarine builder Electric Boat Co. by the name of Allan C. Cameron. At first, he made life tough for some BIW managers. Cameron initiated daily "war room" meetings in which engineering, planning and manufacturing managers got together to review the day's work schedule and the latest on-time performance statistics. "We declared war on [the] schedule in each area of the business," says Cameron.

"The first month of war room meetings was brutal," says McCarthy. The meetings ran for hours and became the scene of intense disagreements about whose data was right, whose wrong; reports from the multiple systems were not balancing.

Accustomed to using an MRPII system in his previous job, Cameron put up with the dissension for only so long. "People wanted to abandon the integrated manufacturing project halfway through, but the COO said, 'I will believe only the information in this [MRP] system, so don't tell me you can't do it,'" recalls Thomas. Suddenly, in one stroke, all the makeshift reports that supervisors relied upon became obsolete.



**"The idea to optimize the entire process was foreign to us. We had to beg, borrow or steal information from all of the crafts to see if a task in the shipbuilding process was done."** *–Stanley Weliever*

Cameron's edict quickly produced some positive results. "The change in the company was dramatic, and we surprised ourselves at how much improvement we achieved almost overnight," says Cameron. Materials availability climbed from 94 percent in January 1994 to 96 percent in the final quarter of 1994, reaching 99-plus percent in July 1995. Cycle time to complete a work order dropped between 30 and 40 percent as well.

"Now when [a part or material] is hot, I know it is hot," says purchasing director Thomas. "So I don't spend money to air freight a part and then have it sit on the line." And daily war room meetings are counted in minutes, not hours.

**BIW'S CONTRACT** *to deliver 18 destroyers (seven down; 11 to go) will keep it in business through the year 2000.*

## Lessons Learned

*And on implementing a successful MRP system after nearly a decade of trying, here's what COO Allan Cameron has to say about the top executive's role:*

- Require daily "war room" meetings to measure the work-order life cycle for every order.
- Demand 24-hour turnaround when a work order is held up so that the problem is solved by next day.
- Educate managers about the cultural changes demanded by an MRP system.
- Believe only the data from the MRP system and act accordingly.
- Be relentless.

## ≈ The Connectivity Strategy ≈

But an edict from the top was only part of the answer to BIW's information management problems. The sheer number of requests for data dumps from the mainframe had been pointing to a technology snafu since the late 1980s.

"We'd put machines on people's desktops to make it easier for them to get the information they needed, but, ironically, in diversifying our platforms, we'd made it almost impossible for them to actually access this information without lots of downloads and replication of data," says Stoy. Although the MRP system's canned reports would eventually allow managers to reconcile their data disagreements, it wouldn't obviate the need for detailed data analysis when problems arose. Whenever a bottleneck cropped up or some other exception emerged, getting data out of the mainframe for analysis would remain as difficult as ever.

"We had given users desktop tools, but we hadn't given them access to a single source of information," recalls Stoy. "But they got smart, figured out what they wanted to download [from the IBM mainframe] and filled out request forms. And [the IS department] didn't have the resources for all these ad hoc requests. So it was a very, very unpleasant situation." Managers, who sometimes waited as long as six months for special reports, grew angry and frustrated with IS.

The question became how to get the mainframe environment and the client/server systems to work in concert. In early 1994, in the midst of the struggle to gain acceptance for the new MRP system, Egan named Stoy to the newly created post of manager of advanced technology, charging him to look at the technologies and find an answer.

Under pressure from post-Cold War defense cutbacks, BIW's IS budget was falling 5 to 10 percent every year. So just ditching the

**JOHN STOY:** *Users had access to tools but not to information.*

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### Technical Profile

**Bath Iron Works Corp.,** Bath, Maine, a subsidiary of General Dynamics Corp.

**Employees:** 8,300

**IS Staff:** 200

**Revenue:** Navy contracts worth $830 million in 1994, with a $2 billion backlog

**Operating Profits:** $50 million in 1994

**IS Budget:** Falling 5 to 10 percent per year

**Users:** 240,000 online transactions daily

**Mainframe:** 2,000 clients on the IBM ES/3090 500J, the main repository for payroll, financial, labor systems and materials management systems stored in IMS, VSAM, Datacom and DB2

**Nodes and Servers:** 480 clients using 26 Unix servers, 3,000 clients on 36 Novell NetWare 3.12 servers, 150 on an IBM AS/400 system, and 5,000 laborers using a new bar-code time attendance system running on 10 Hewlett-Packard 9000 servers

**Software:** Oracle relational databases support CAD applications; Informix software runs the RDBMS for the HP 9000s; Powersoft's PowerBuilder toolkit for development and ad hoc reporting on the Novell LANs; Microsoft's Office suite

**Middleware:** Sybase OmniSQL Gateway and Net Gateway; SQL Server; Sybase Net libraries for Oracle and Informix; AS/400 Gateway

mainframe and reinvesting in entirely new client/server equipment did not seem practical. "We had some people who wanted to replatform everything...but our strategy could not be to replace or reengineer the legacy systems; we needed to connect our infrastructure," says Stoy. To solve the interoperability problem, Stoy needed tools to provide seamless access to the legacy system databases for the clients using desktop tools.

By July 17, 1995, just a year and a half after Stoy began an enterprise architecture analysis and two weeks ahead of schedule, Bath began full-scale implementation of Sybase Inc.'s gateway connectivity software. So prepared was Stoy for the new system that he even let his IS team take off the July 4th weekend prior to the rollout.

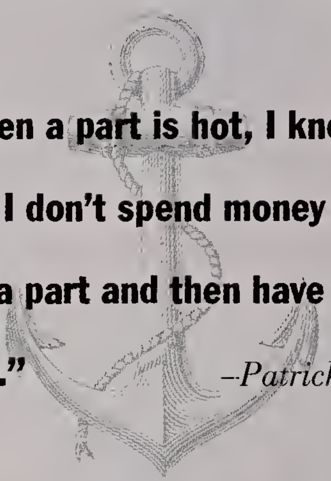
Desktop clients now have access to data scattered across the company's diverse platforms, including the financials on the IBM ES/3090 mainframe, the planning yard's schedules on its AS/400, engineering's Sun Unix servers and payroll's new HP 9000 attendance system. The Sybase OmniSQL Gateway, which runs on a Sun SPARCserver 10 workstation, provides users with access to most of Bath's major databases, including DB2, Informix and Oracle. Counting both the Sybase software and the PowerBuilder development tools from Powersoft Corp., the connectivity strategy cost just $635,000—significantly less than a wholesale client/server migration.

Most of Bath's departments are still just rolling out new applications to take advantage of the new connected infrastructure, so return-on-investment figures are not yet available. The engineering department and the planning yard, for example, are in the middle of a major redesign to take the thousands of mechanical and electrical drawings of the destroyers built at BIW that are currently kept on microfiche cards and paper and transfer them to digital images that can be accessed online. (See related story, Page 46.)

The connectivity strategy's impact on the MRP system is just beginning to be felt. McCarthy from production planning, for example, crows that after a four-week investment in training on Infomaker software, a member of his staff took just six hours to put together an analytical report of warehousing performance. Under the old system of submitting a request form to IS, McCarthy says he would have waited six months for a canned MRP report to be created. "We had warehouse problems buried down there in the data that we never even knew were there," he says.

So, does this story have a happy ending? Perhaps for now, but the future looks mighty uncertain. Congressional budget cutters who have so far managed to spare the remaining Navy contracts may not continue to do so. And commercial shipbuilding, a staple of BIW's business until it sailed away to East Asia in the 1970s, won't be easy to lure back.

But with a $2 billion backlog of orders that includes 11 Arleigh Burke-class destroyers, Bath has enough work to keep it busy until the year 2000. That backlog, along with the influence to be garnered from Maine's Republican Senator William Cohen, the powerful chairman of the Senate's Armed Services seapower subcommittee, was enough to entice General Dynamics Corp. of Falls Church, Va., owner of Electric Boat, to purchase BIW in August 1995. (General Dynamics paid $300 million for BIW to The Prudential Insurance Co. of America, which had bought the iron works from Congoleum Corp. in 1986 for a whopping $580 million.)



**"Now when a part is hot, I know it is hot. So I don't spend money to air freight a part and then have it sit on the line."** *–Patrick Thomas*

The new owners have lifted one heavy burden from the backs of BIW's management—a large debt that was incurred during Prudential's leveraged buyout. But management at General Dynamics also brings a history of abandoning shipyards that stop making money—they closed the Fore River Shipyard in Quincy, Mass., in 1986, laying off more than 4,000 workers.

Nonetheless the Bath workforce is buoyed by optimism. "One of our workers said it best," recounts Cameron. "We were owned by a linoleum company, then by an insurance company and now by a shipbuilder!" So, for now, the morning mist still rises from the river, rush-hour traffic still clogs Route 1, and Bath's quest to optimize the mix of old and new technologies continues to keep the IS group busy. CIO

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*E.B. Baatz can be reached at* ebaatz@cio.com.

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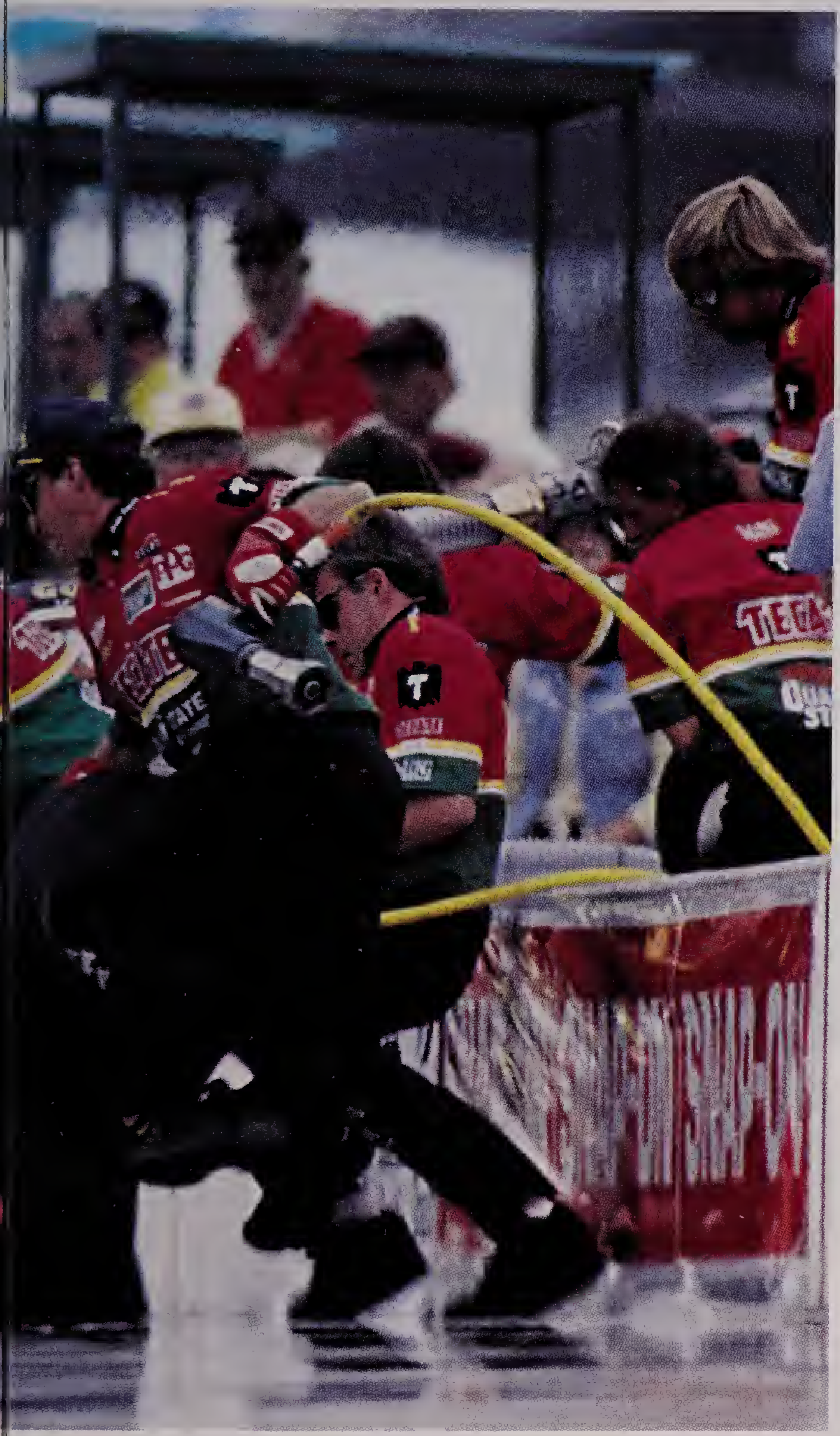

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# Dutch Ma

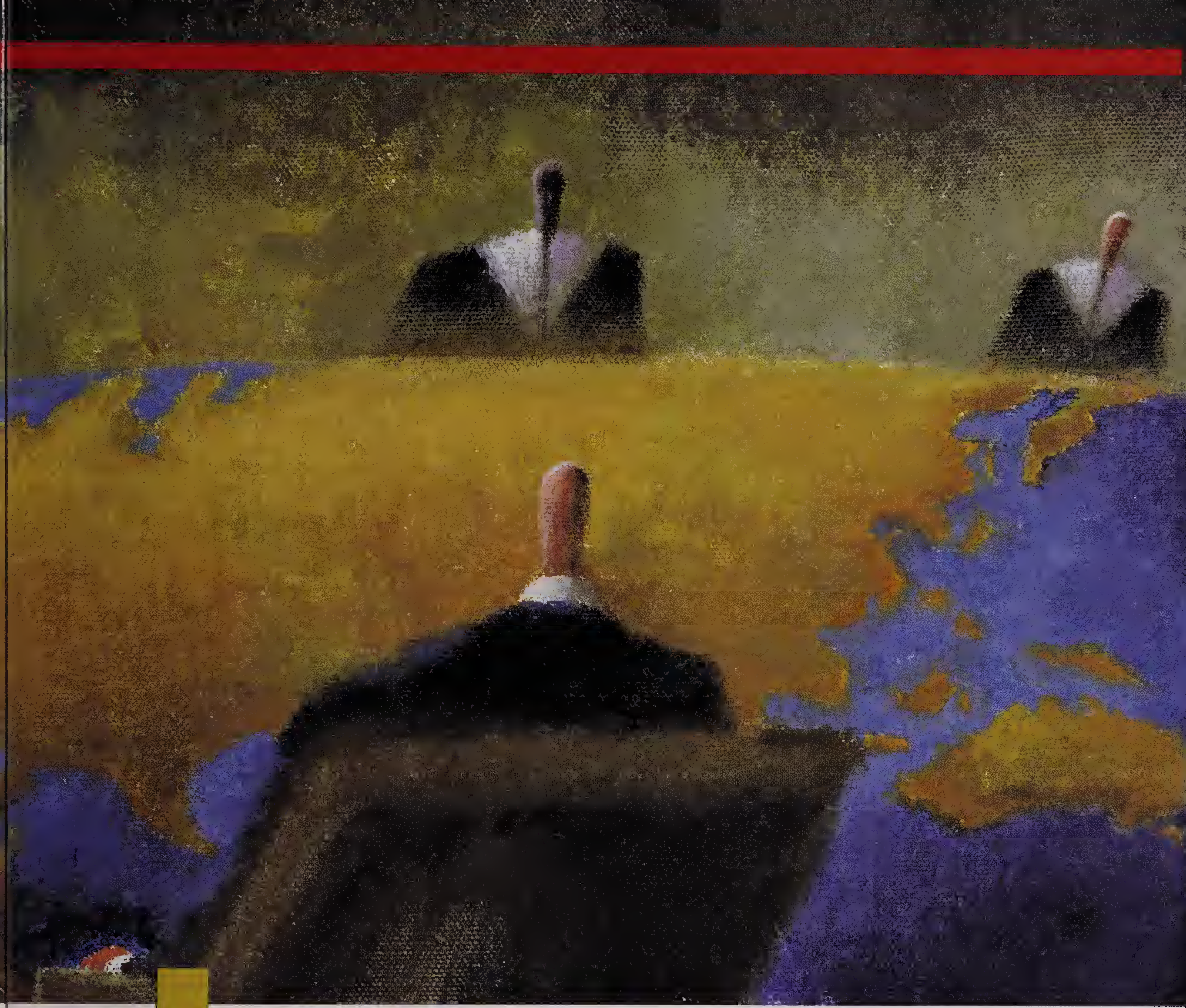
A discussion with seven executives in the Dutch information systems and services industry provides proof that, at least for IS management, it's a small world after all

BY RICHARD PASTORE

AMSTERDAM, CAPITAL OF THE NETHERLANDS AND ARTS mecca for Northwest Europe, often played host to the Dutch masters of the 17th century—Rembrandt, Vermeer, de Hooch, Steen and others. Last spring, the city hosted a different group of Dutch masters, this one of information systems. Seven executives in charge of IS at some of the largest companies and public-sector organizations in Holland assembled to discuss pressing IS issues and strategies with *CIO*. Arranged by Moret Ernst & Young Partners Frans van Veldhoven and Theo de Loos, the roundtable represented a microcosm of Dutch IS management and an opportunity to examine the IS state of mind in this canal-laced country.

For our American readers, this roundtable provides insight into

*Editor's Note: As of June, when this roundtable took place, one Dutch guilder was the equivalent of 65 cents (U.S.).*



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the issues faced by their European counterparts. For CIOs of multinationals, the conversation also illuminates some of the headaches of managing decentralized IT installations across multiple countries. The most passionately discussed topic was the increasing decentralization of IS and the management difficulties and responsibilities that come in its wake. As a whole, the group sees a swing toward decentralization. But there is some disagreement on how best to manage and how it will influence the evolving role of the IS manager.

Joining us on the panel were the following:

- **Klaas Molenaar**, managing director of strategy and development at Achmea Group, an 11 billion guilder ($7.2 billion U.S.) insurance and banking company based in Naarden.
- **Alex T.W.M. Oostvogel**, board member responsible for finance, IT, logistics and real estate of P&C Group N.V., a Rijswijk-based retail clothing store chain with revenues of 457 million guilders and 109 locations across four Northwest European countries.
- **R.A.M. Pruijm**, professor and advisor to the board and IT management team of ING Netherlands, an Amsterdam-based financial services firm that employs more than 50,000 people. Pruijm is also an IS professor at Erasmus University in Rotterdam.
- **N.J. Trapman**, board member, CFO and head of IT at ANWB, a diversified Dutch tourist and motor club based in The Hague, with 3.5 million members.
- **Frans van Anraat**, vice president of the information management consultancy, division of investment banking and global clients of ABN AMRO, an Amsterdam-based bank with more than 500 billion guilders in assets, 2.2 billion

ILLUSTRATION BY PAUL ZWOLACK

guilders net profit and about 60,000 employees at year-end 1994.

- **A.F. van Daal**, business unit manager, technology and network services of SENS (Stichting Exploitatie Nederlandse Staatsloterij). Based in The Hague, this Dutch state lottery controls 45 percent of the country's 1.5 billion guilder lottery market.
- **Arnoud D. Vellinga**, formerly director of information management of Sociale Verzekeringsbank (Social Security Bank), the Amstelveen-based Dutch government agency that pays senior citizen and children's welfare benefits. Since the roundtable was conducted, Vellinga has joined Tandem Computers Europe Inc. as business manager for the Alliance Group.

**CIO:** *Is decentralization of information systems management an inevitability for most large organizations?*

**VELLINGA:** It depends on the type and size of the organization. At the Social Security Bank, business is conducted the same way across our regional offices every week. That's one reason we were able to centralize. In 1988, we integrated two organizations. One was completely decentralized, one was completely centralized. To control our strategy and realize our commitments to the government, we decided we had to centralize.

We also have to control our total cash flow of 43 billion guilders a year. We are not too big to handle that centrally. But if an organization is too big, I think you might have to decentralize.

**TRAPMAN:** I wouldn't have a hope for the next 20 years of centralizing. We are a Dutch club, but we have to be European these days because all our members are traveling abroad. In Europe, there are eight independent national clubs, and it would be impossible for us to get some centralization because of all the different nations, strategies and cultures. But we do have to link our systems to service our members abroad, so we decided to do that by standardizing our data and interfaces, which is a major job.

**VAN ANRAAT:** My company is the product of a merger between ABN and AMRO. At the moment, we have a combination of centralized and decentralized functions, but preparations are underway to reorganize our total IS organization over a period of several years. Hardware and software responsibility will be embedded in the bank's organizational structure, based on its three commercial divisions. For our divisions, that means development will be done on the basis of lines of business through the creation of "competence centers."

**"When development of systems is decentralized, the people in the business units have the attitude that they are kings. So they are not preparing IT standards or following guidelines. It's the CIO who must enforce that."**

**–KLAAS MOLENAAR**

**CIO:** *Is decentralization the solution to improving service to IS customers?*

**PRUIJM:** You have to examine the problem and decide whether you will solve it with decentralization. I don't think there is any correlation between decentralized or centralized IS when it comes to delivery of quality service, better time to market or faster response time. The main driving force is how you organize processes.

At ING, the main problem was with the service of the central IS organization. I believe we could have solved it in another way besides decentralization—by creating full-service development teams—but the users didn't give us the time. ING had recently implemented a decentralized organizational structure, and there was a lot of pressure to decentralize IS.

**TRAPMAN:** I disagree about the lack of correlation. The chances that an IS professional in a decentralized environment will have better quality output is substantial compared with one who walks in and out of a building with only IS professionals around him. It is of major importance that, if you are working for an insurance company, you are sitting among people talking insurance language. If you sit among IS staff, you might think that IT is everything that exists. You should feel that insurance is everything that exists.

**PRUIJM:** That's a wrong vision. Our business units work in different buildings from IS, but there is heavy traffic between those buildings. It doesn't matter much that the IS staff is working in one building and the commercial staff in another. The main thing is how well they are communicating.

**CIO:** *In cases where IS staff are dispersed within business units, how can central IS authorities hope to stay aware of and manage what goes on with IS within business units?*

**MOLENAAR:** I think that's an important role of top management in the decentralized group.

**VELLINGA:** I agree. Successful decentralization depends not only on decentralizing IS functions but also on decentralizing management responsibility. The whole organization's structure must be the same to make sure business-unit managers take responsibility for their IT actions.

**OOSTVOGEL:** IS should support the processes of the organization and be an integral part of the strategic planning process. In that respect, the chief executive is responsible for the strategy, including the IT part of it. But you must make sure that communication between the subsidiaries is good, so the CIO must provide guidelines and structure within which the units are able to operate.

**CIO:** *Some of you manage IT across national boundaries. How difficult is obtaining consistent quality support and purchasing synergies in these situations, especially in decentralized environments?*

**VAN ANRAAT:** IS decentralization adds to the already difficult chores of purchasing and supporting IT across international units. After the merger, we tried initially to centralize purchasing, development and support for our foreign branches. Now, it's a combination. The infrastructure of computers and telecommunications is the responsibility of a specialized directorate at the head office, and development of core system functionality is centralized. Our foreign subsidiaries exercise local responsibility for everything else within an IT policy framework of the head office.

**"I don't think there is any correlation between decentralized or centralized IS when it comes to delivery of quality service, better time to market or faster response time. The main driving force is how you organize processes."**

**–R.A.M PRUIJM**

**PRUIJM:** Local suppliers try to protect their own geographic market. But if you're a large enough company, you can get them to accommodate you. It depends on your size and purchasing power. When we want to make a centralized purchase for multiple locations, we go to the supplier's headquarters to make the deal.

**CIO:** *How will the evolution of the IS manager's role be influenced by decentralization?*

**VAN DAAL:** We outsourced our network activities and felt we needed an IS person to manage the contract. You would also need a central IS authority to maintain oversight of the decentralized infrastructure.

**TRAPMAN:** I think the CIO's role will be less important in the future. The only thing a CIO will have to do is give users a set of standards and establish some rules. Everything else will be provided by the marketplace—the tools, the applications, the environments. He or she will be more of an auditor or controller rather than a policy maker. From a group point of view, the CIO won't have to think about strategic direction.

**OOSTVOGEL:** There's a big difference in the levels of support available in different countries. With my previous employer, Shell Portuguesa S.A., it was a problem. Support for AG Edwards software at Shell in Portugal was not there. It had to come from Spain, and they had problems because their knowledge was not that strong. A large company can sometimes facilitate support by flying people in from the U.S. or the U.K.

**TRAPMAN:** We found that trying to get an umbrella on purchasing IT was nearly impossible across Europe. The clubs are local companies with their own local polices, and they don't want to centralize those policies by using these umbrella [vendor] companies.

We looked for the biggest user and asked them to buy for us and the other local clubs. They said they couldn't do that; we would each have to buy from the local vendor—Holland in Holland, Spain in Spain, Italy in Italy.

**CIO:** *There's been a lot of criticism directed toward the vendor community about this issue. Most vendors, although they boast about being global, won't allow centralized IT purchasing for sites in multiple countries. Is that changing?*

**TRAPMAN:** Vendors haven't changed. They don't want to handle orders for multiple countries in a uniform way. The [local vendors] all have their own responsibilities for profits and so forth.

**PRUIJM:** I disagree. I'm a strong believer in decentralization, but everything has its price. How do you get sufficient synergy in a decentralized environment? You have to organize for it. But the main problem is you can't tackle long-term business decisions unless you have someone [in IS] with a centralized view. We have to cope with a lot of different organizations, and that's difficult.

**TRAPMAN:** Today you are right. But five years from now, I believe the CIO will be more of a controller, a chap who says to the board that the users have done it this way under these circumstances and adds it all up for them.

**MOLENAAR:** When development of systems is decentralized, the people in the business units have the attitude that they are kings. So they are not preparing IT standards or following guidelines. It's the CIO who must enforce that.

**PRUIJM:** But we don't want to be watchdogs. At ING, we have decided that will no longer be our main role. It's a role for the board of management. We want to be as free as possible [in order to focus on offering] a broader range of services. We've organized a policy where [business unit] directors have to decide IT standards, the level of synergy and the level of standardization. How far to go with that is their decision, not ours. CIO

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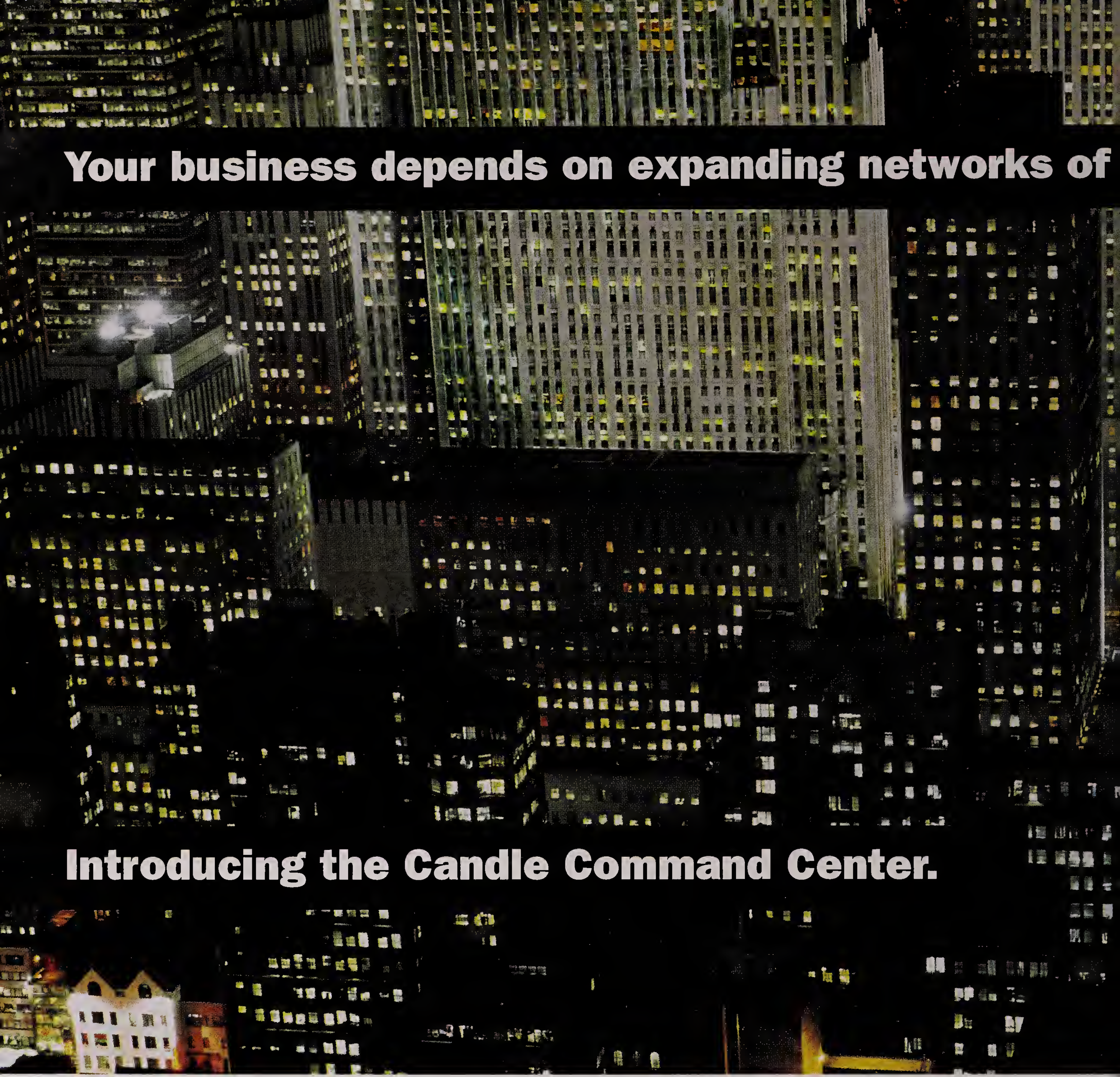
*Richard Pastore can be reached at* pastore@cio.com.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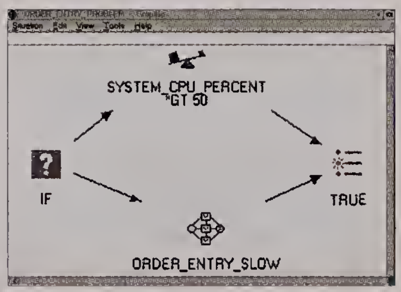

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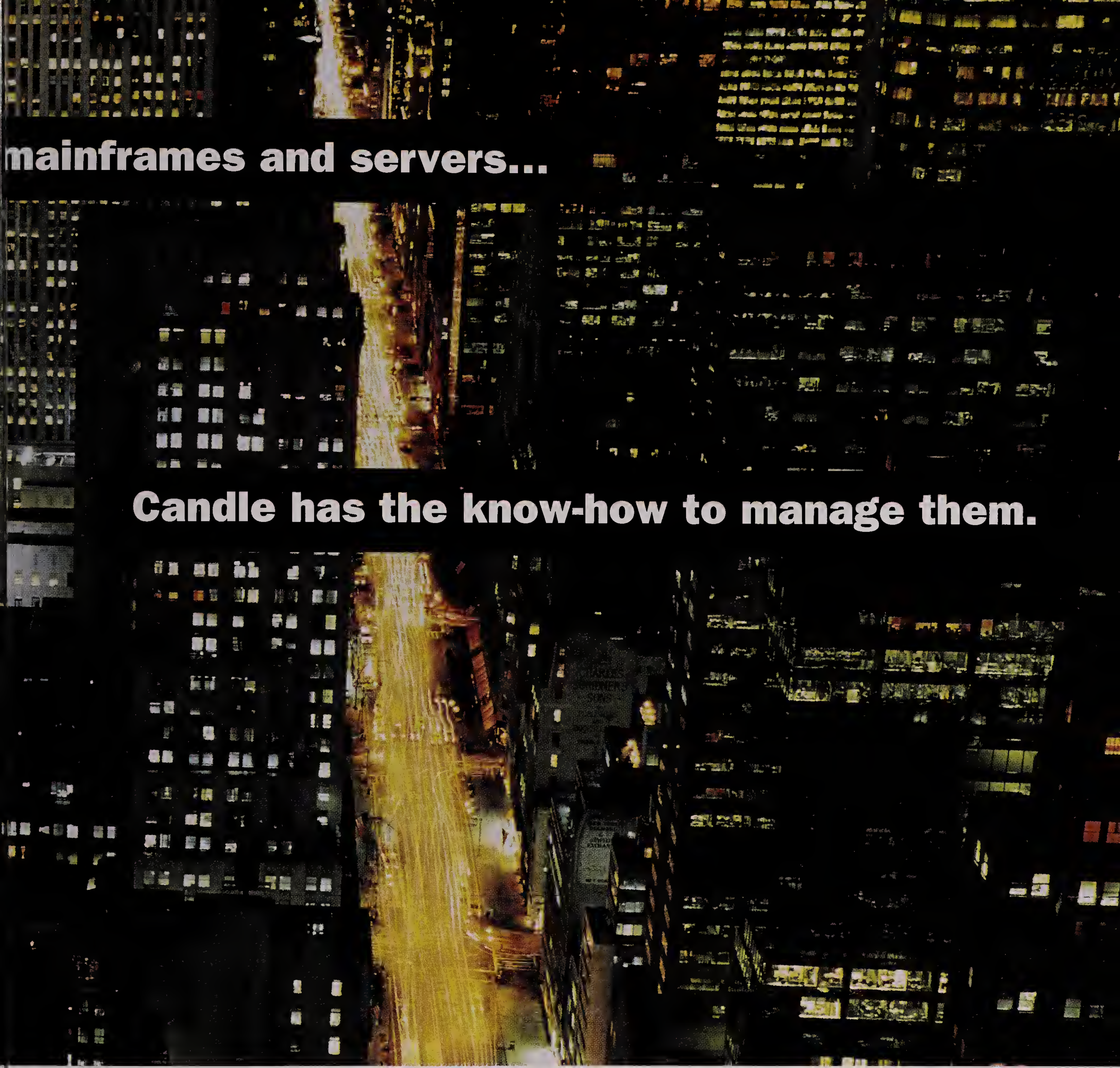
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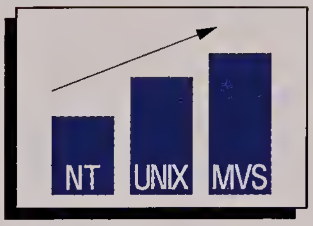

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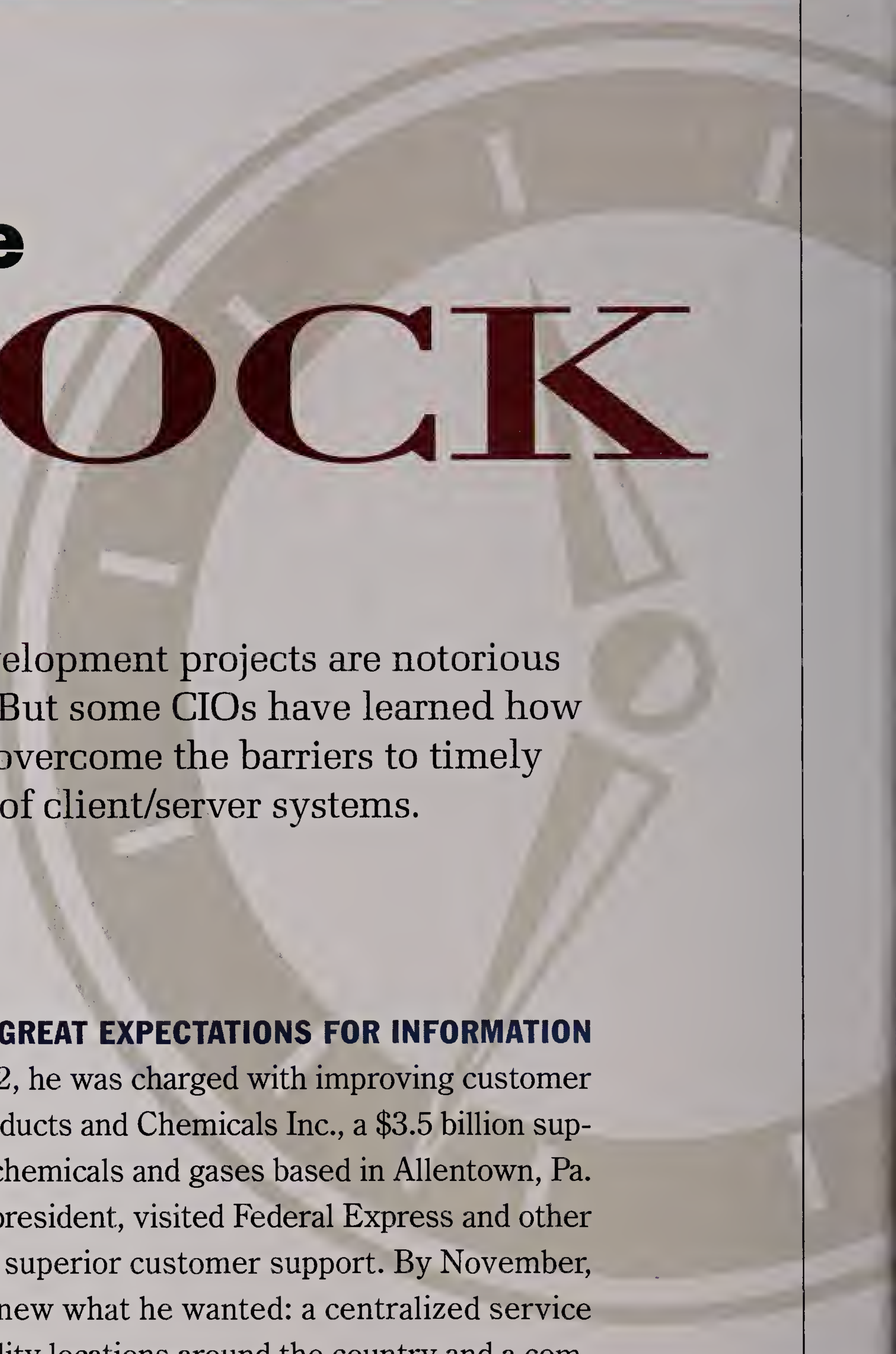

PHOTO BY DAVID FIELDS

# Beat the CLOCK

Client/server development projects are notorious for their lateness. But some CIOs have learned how to identify and overcome the barriers to timely delivery of client/server systems.

**STAN ROMAN HAD GREAT EXPECTATIONS FOR INFORMATION** technology. In 1992, he was charged with improving customer service for Air Products and Chemicals Inc., a $3.5 billion supplier of industrial chemicals and gases based in Allentown, Pa. So Roman, a senior vice president, visited Federal Express and other companies renowned for superior customer support. By November, he'd seen the best and knew what he wanted: a centralized service center to replace 150 facility locations around the country and a computer system to feed workers the customer information they needed at a moment's notice. The system had to be set before he could consolidate centers, and six months was as long as he would wait. With a deadline in tow, Roman passed responsibility to his hand-picked implementation team. "It scared the hell out of us," says Roger Bast, director of MIS for the Worldwide Gases and Equipment Group and head of IT for the project. Two years would have been a much more realistic time frame for a first-time client/server project that included integrating data from disparate legacy systems, he adds.

BY LYNDA RADOSEVICH

**STAN ROMAN** *(l.) and* **ROGER BAST** *oversaw a successful client/server development project to improve customer service at Air Products and Chemicals.*

**TIM THERIAULT** *used a Notes-based bulletin board for fast response to developers' questions.*

PHOTO BY ANDY GOODWIN

Despite his fears, Bast's team delivered the goods. In October 1993, 12 customer service reps began using the new Single Point of Contact (SPOC) system. Now 150 reps use SPOC to service roughly 60,000 customers. SPOC comprises Sybase databases on Hewlett-Packard Unix servers, graphical front ends developed using Visual Basic, and gateway links to mainframes from IBM and Tandem. It provides information on deliveries, orders, billing and complaints, and enables customer reps to service calls on the spot. Bast's recipe for meeting the clipped deadline: Challenge traditional development methodologies, bypass steps considered essential in the past, and let end users and managers drive the application design and development process.

Bast's predicament is not unique. Increasingly, business managers such as Roman are factoring IT into the business bottom line, and they want to see real results fast. Client/server computing is the favored method for delivering those results, but the stakes are high. In companies with revenues over $500 million, only 9 percent of software development projects come in on time and on budget, and the average time overrun is 230 percent of the original estimate, according to the Standish Group International Inc., a market research and consulting company in Dennis, Mass. Being late is no trivial matter. In fact, experts say late delivery is a key factor behind high CIO turnover, which ran at 15.5 percent in 1994, according to a Deloitte & Touche survey (see "Client/Server Everything," *CIO,* July 1995).

CIOs can overcome obvious factors behind client/server delays—new technologies and limited staff experience—by turning to outside experts and consultants. However, there are more subtle and odious influences at work that stretch tight development time lines to the snapping point: lengthy and rigid analysis schemes that induce "analysis paralysis," escalating specifications known as "scope creep" and unrealistic expectations (which have yet to acquire a clever buzz term). To deliver their client/server projects on time, survivalist CIOs such as Bast are finding new ways to wrangle around these time crunchers.

> **In companies with revenues over $500 million, only 9 percent of software development projects come in on time and on budget, and the average time overrun is 230 percent of the original estimate.**

### Analysis Paralysis

"One of the biggest time sinks you will find in the application development process is the value definition process," says Thornton May, vice president of research and education at Cambridge Technology Partners, a Cambridge, Mass., systems integration and consulting firm.

A classic analysis paralysis situation, says May, is the "value chain" model devised by Michael Porter, a professor at Harvard Business School. Under this model, companies first study and decompose the steps of a business process, whereby workers add value to their customers (whether internal or external to the company), who in turn add value to their customers. Then business and systems analysts link the parts of the value chain and develop computer systems behind the whole. "It's conceptually very compelling, and it has put a lot of butts through ivy-covered MBA programs," May says. The trouble is, the analysis takes a long time and value chains are not static, he says.

To save time, Bast's team heeded May's advice and turned this study period on its head. Rather than determining needs and returning with a schedule, they first committed to a deadline, figured what they could complete in that time frame, then began prototyping. "To really deliver these applications on time, you need to put a stake in the ground and work backward," Bast says.

Porter, however, cautions against shortcutting the analysis phase. "Not carefully thinking through the competitive needs in systems development is a false savings in terms of systems development time," he says. "Delivering bad applications 'in time' is not the right goal. The goal should be to reduce unnecessary and unproductive time throughout the process." The way to do that is to focus value chain analysis on the key questions that will really affect systems needs, do various tasks in parallel and build systems on proven, flexible development platforms, he says.

Yet some CIOs are realizing significant benefits from keeping analysis brief. Tim Theriault, senior vice president of technology at Northern Trust Bank, a multibank holding company in Chicago with $18.6 billion in assets, says that abbreviating the requirements analysis phase and launching into iterative prototyping helped him make neat work of a $125 million client/server system called Passport. Passport provides a single point of access to all Northern capabilities, including online viewing of reports, ad hoc reporting, transaction initia-

## The Good

In the final leg of its maiden voyage into client/server land, Ryder System appears to be arriving in good shape despite an initial void of in-house client/server skills

**BRUCE FRCEK** *kept Ryder's client/server transition in-house to develop internal employees' skills.*

PHOTO BY JEFFREY A. SLATER

Truck leasing and logistics giant Ryder System Inc. is installing a client/server system that instantly provides utilization statistics on roughly 200,000 trucks to 1,400 employees. The system gathers records from sources such as general ledger and maintenance databases, centralizes the data in an IBM relational DB2 database, then parlays it to Gupta databases in district and local offices. There, managers can view local, regional or district activity and compare it with Ryder's global picture.

At the outset two years ago, Ryder was a traditional mainframe shop that lacked the skilled staff to tackle such a project alone, says Bruce Frcek, senior project manager. But rather than handing off responsibility to a systems integrator, Frcek kept the project in-house. His goal in doing so was to leverage existing staff's knowledge of legacy systems and develop the client/server skills of internal employees.

Ryder employees worked in close-knit teams with consultants and vendors, who "filled in bodies and certain skill areas that we didn't have in-house," he says. For example, as the primary partner, Andersen Consulting assisted in the design and implementation of the system. Powersoft Corp. trained the developers, and its consulting group reviewed the design of the application architecture. Sterling Software Inc. assisted in developing CASE expertise.

This partnering approach could help alleviate what CIOs say is one of the leading problems with client/server development: lack of skilled staff. The 400 respondents to Deloitte & Touche's Seventh Annual Survey of CIOs (1994) rated the job of client/server technical architect as the most troublesome to fill; 79 percent of respondents reported significant difficulty recruiting staff for the position.

For Ryder, the main challenge was building a strong team that would properly integrate end users as well as balance the development of in-house skills with the use of outside expertise. First Frcek determined how much in-house client/server expertise he needed to develop for long-term support. Then he figured how many people he needed to seed future client/server projects.

During heavy programming mode, the breakdown of contract labor to in-house labor was 75-25 out of 80 total people. That leveled off to a 50-50 mix as the project matured. Now that the system is in production, it's run 95 percent by Ryder staff. By Ryder's account, the project is a great success. The system cost more than $10 million. But the estimated payback includes roughly $7.6 million from improved usage of rental trucks in the first year, $3 million in vehicle sales and $1.2 million in savings from disposing of trucks with high running costs. *–L. Radosevich* tion, performance analysis, securities lending, risk management and collaborative technologies. "Andersen Consulting told us it would take two years, and we did it in about nine months," says Theriault.

Iterative prototyping is a partnership between IS and business users that allows simultaneous analysis, design, coding, testing and training. It's enabled by rapid application development software such as PowerBuilder, Visual Basic and C++. Before the Passport project, Theriault says Northern was a typical mainframe shop that used the more traditional linear process, in which development doesn't move from one cycle to the next until the prior one is complete.

Iterative prototyping can save time, but to make it work, companies have to heavily involve users. For instance, Air Products had six customer service specialists working full time with IS on its project. The users helped programmers make smaller design decisions on the spot, and although the project pulled the specialists away from their regular jobs, it was necessary. Not to have done that "would have impeded the ability to make day-to-day decisions, which can drag from days into weeks and cause missed deadlines," Bast says.

To coordinate Northern's iterative efforts, Theriault's cross-functional teams used an online bulletin board set up in Lotus Notes. "I think that had the biggest effect," he says. For example, developers could post questions in Notes, receive responses and resolve an issue in 20 to 25 minutes rather than the week or so it might have taken otherwise, he says.

### Scope Creep

Another common barrier to timely client/server development is scope creep. "You define what to build and begin building it," Bast says. "But people say, 'Oh, can't you add this?' 'Why don't you do this?' These are nickels and dimes, but they add up to dollars."

Always a problem, unfettered demand for additional capability is more likely in client/server application development because it is more flexible than mainframe development and offers users more options. Without a mechanism for making development decisions based on the big-picture needs of the business, IS might be tempted to act on such demands simply because they can, Bast says.

The best way to check scope creep, according to Rob Tabb, vice president of information systems for Ryder System Inc. and CIO for Ryder Commercial Leasing and Services, is to be disciplined about estimating and documenting the time and money costs for all scope changes, then let the business people make the tough decisions.

For instance, J. Ernie Riddle, executive vice president of sales and marketing at Ryder, was faced with a scope change decision during the transportation company's first major client/server project: a new asset-management system (see related story, Page 67). Riddle was the project's "process owner" and had overall responsibility for all aspects of the multimillion-dollar undertaking. Early in the development effort, users realized they could improve customer service by adding screens that would give customers access to portions of the data. Riddle says he weighed the business value of adding customer screens against the three months' worth of additional effort it would take. He decided to increase the project's budget and add team members to build the customer-access capabilities without extending the project deadline.

Offloading such scope change decisions to business-process managers not only keeps the project on track, it keeps the heat off IS. "The [internal] client was in the canoe with us," says Ryder's Tabb. "The same forces and pressures that were operating on us were operating on them. We didn't end up being the bad guys, and we weren't viewed as being obstructionists." That has not always happened in the company, he adds in a voice loaded with understatement.

### Management Expectations

It may not be enough to focus on controlling analysis and scope, however.

## The Bad

Unrealistic deadlines added to the delayed opening of Denver International Airport

Perhaps the most notoriously botched client/server project is the baggage system for the Denver International Airport. The system was supposed to improve baggage handling by using a computer tracking system to direct baggage contained in unmanned carts that run on a track. Originally scheduled for completion in March 1994, the unfinished $234 million project helped postpone opening of the airport until February 1995. The delay reportedly cost the city roughly $1 million per day in operations costs and interest on bond issues.

Contributing to the delay were unrealistic deadlines and late specification changes, according to a spokesman for BAE Automated Systems Inc., the Carrollton, Texas, systems integrator in charge of the project. BAE originally quoted a time frame of four years to get the job done. But Denver insisted on compressing that to two years, which BAE grudgingly accepted as long as the city adhered to BAE's proposal conditions—including "freeze dates" after which all specs would be frozen and changes halted. But as development progressed, the city and county ordered 17 major changes—one costing $100 million—as much as nine months after the freeze dates of the original proposal. *–L. Radosevich*

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**ROB TABB:** *"We didn't end up being the bad guys, and we weren't viewed as being obstructionists."*

Sometimes IS executives must deal with unreasonable management expectations. But when expectations run out of control, CIOs are usually to blame, says Michael Schrage, research associate at the MIT Sloan School and author of *No More Teams! Mastering the Dynamics of Creative Collaboration*. "With CIOs, often the problem isn't just credibility, it's integrity," says Schrage. Intent on looking like winners, "they'll say, 'Aye aye sir, I'll take that trench,' then subject their staff to demands that can't be met."

Tabb, Theriault and Bast agree that straight talk is key to building realistic management expectations about client/server time frames. For instance, Tabb says there was a great deal of pressure within the organization to get on with the asset management system. His challenge was to contain that pressure and complete a strategic scoping and initial design phase before locking into a schedule and feature set. That required walking executives through the methodology and convincing them that focusing on the early phases was better than trying to resolve issues later on. It worked, in part, because "I was a new vice president at that time. People were saying, 'We have to give this guy a chance.'"

For Theriault, the trick was letting management know that a prototype wasn't a finished application. "When we would prototype something, the expectation was that that's done, and they would think, 'I can start using it in a couple of weeks.'" In response, he clearly stated that his group still had to develop the local area network, create links with the server databases, conduct system tests, run user tests and distribute software before the application would be ready for production use.

At the end of the day, this type of communication is key to keeping users and management happy and keeping jobs secure. For instance, Stan Roman said the customer service application "definitely" met his expectations. Not that he wouldn't have liked it even sooner; despite accelerated systems development, the entire reengineering process "seemed like an eternity," he says. But he understands that the IS staff beat some slim odds and says he is quite happy with the system that has helped lower costs by 50 percent and improve service immeasurably.

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*Lynda Radosevich is a freelance writer based in Belmont, Mass. Her e-mail address is* lradosev@interserv.com.

## Best Practices for Timely Application Development

- **Change the information technology culture so that a business-unit executive identifies important technology services, funds them and implements them.**
- **Focus resources on problems of the highest priority for the business.**
- **Increase end-user participation during the entire course of the project, not just during the initial phases.**
- **Put in place a governance mechanism whereby business executives and users choose between trade-offs that will affect the project schedule and costs.**

PHOTO BY JEFFREY A. SLATER

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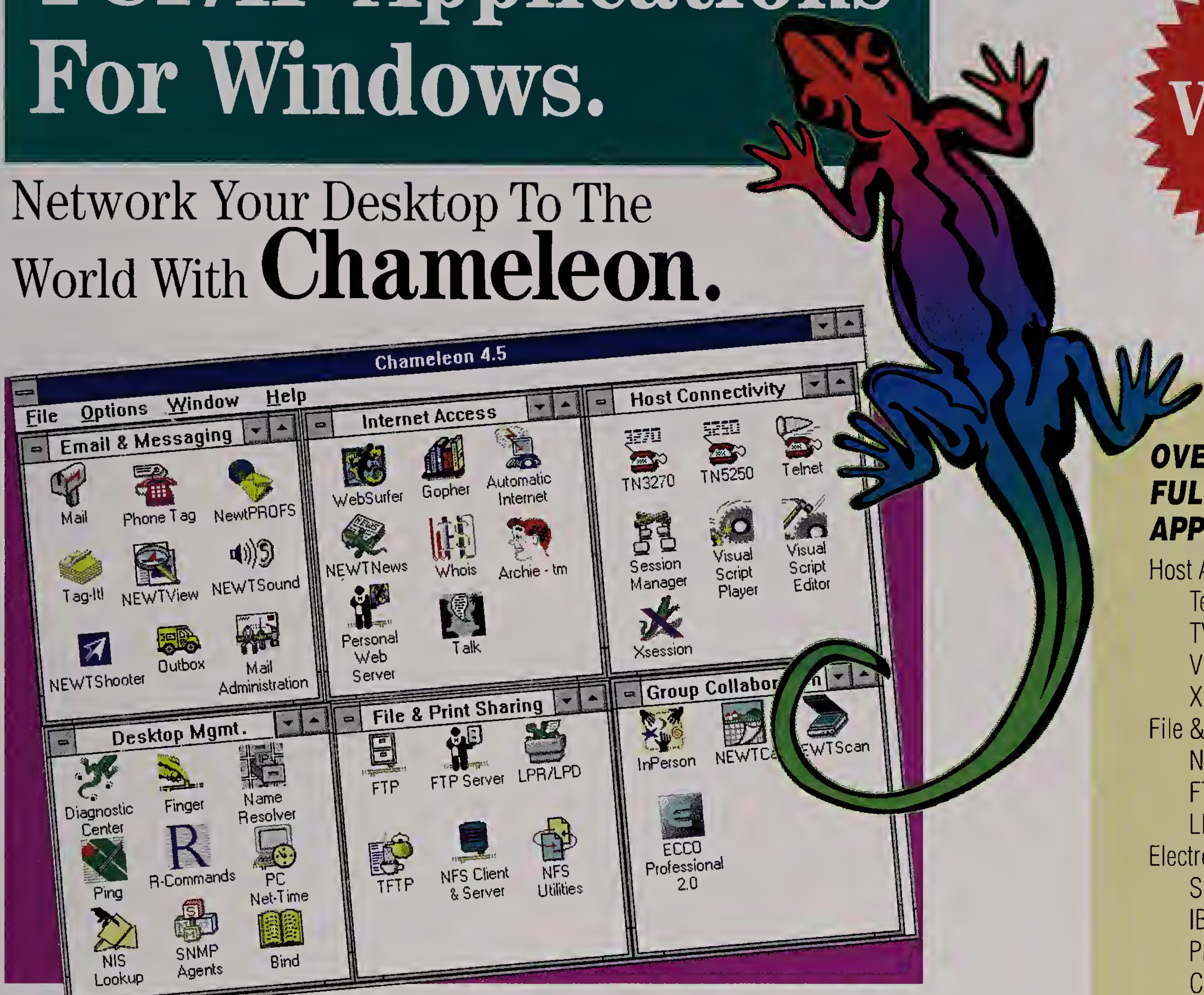

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# Quality German (Re)engineering

BY JACK EWING

With bald tires and the road ahead full of tacks, Volkswagen needed IT's help to retool its business for greater speed, lower costs and higher productivity—without running down its domestic workforce

## IN THE SPOTLIGHT

### VOLKSWAGEN GROUP, WOLFSBURG, GERMANY

**Business:** Automobile and commercial vehicle manufacturing, financial services, automobile rental

**Revenues:** DM 80 billion in 1994 ($55.6 billion U.S.)

**Personnel:** 238,000 worldwide

**Competition:** Northwest European ports of Antwerp, Hamburg, Le Havre and others

IN LATE 1993, HARSH ECONOMIC WINDS WERE HOWLING through the factory-town streets of Wolfsburg, Germany, home to Volkswagen AG. Auto demand in Volkswagen's core domestic market was stagnant. A worldwide recession, which hit key markets in the United States and South America, had helped depress vehicle sales by 14 percent. Resurgent American automakers such as Ford were closing the productivity gap. The result was a staggering loss of 1.9 billion marks ($1.32 billion) for Volkswagen Group, Volkswagen AG's parent company. Its Spanish subsidiary, SEAT, nearly went out of business. Against this backdrop, Volkswagen began a reengineering project designed to set the world's fourth-largest automaker back on the road to recovery.

PHOTOGRAPHY BY PETER BONINGER / LAISON INTERNATIONAL; ILLUSTRATION BY JEFFREY PELO

1973

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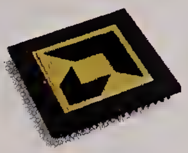
The Kentucky Derby. The Preakness. The Belmont Stakes. The first horse in 25 years to sweep the Triple Crown. If you'd only known. Well, know this: Advanced Micro Devices is the world's second-largest producer of microprocessors. For 26 years, we've delivered premium performance without a premium price. And now AMD is launching the next generation K86 Superscalar™  family of Microsoft Windows® compatible micro processors. This technology will dramatically change the nature of competition in the PC industry. Innovation like that could bring you quite a payoff

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In some ways, VW's efforts were similar to reengineering projects undertaken by hundred of companies around the world. The buzzwords were all there: "business processes," "customer orientation." Volkswagen needed to identify customer needs, quickly design products to meet those needs and bring those products to market as fast as possible. The role of information technology was to speed the flow of information among designers, managers and dealers. "Time is the most important strategic competitive factor," wrote Peter Hartz, VW's director of human resources, in a 1994 book.

But a visit to Wolfsburg, VW's birthplace and headquarters, shows why the company's reengineering project was uniquely European—colored by the political and labor sensibilities that prevail on the Continent and particularly in Germany. Though most reengineering projects deify the customer, Volkswagen also had to include the employee among its holy icons.

**IT enabled factory-floor efficiencies to help shoehorn five-day-plus production levels into four days of work.**

Located on a plain a few kilometers from the former Iron Curtain, Wolfsburg, the city, was founded around Volkswagen, the auto plant. The streets are straight and wide, built for cars rather than pedestrians. In the evening, teenagers in souped-up Beetles roar from one end of town to the other, as if this were Albuquerque rather than the Old World. But the city plan isn't the most important thing owing something to VW. The local economy is highly dependent on the mammoth factory—1.5 million square meters—that employs 47,800 people and is the world's largest auto manufacturing operation under one roof. With a population of about 128,000, there's nary a Wolfsburg family that doesn't earn some of its daily bread from Volkswagen. And there are thousands more VW jobs in nearby cities like Braunschweig and Hanover.

**DIETER SCHACHER:** *Volkswagen couldn't manage "only according to money."*

Adding to this sensitive situation, the pro-labor Social Democratic state government of Lower Saxony, where Wolfsburg and several other VW operations are located, owns 20 percent of company stock. Gerhard Schroeder, the state's minister president, sits on VW's supervisory board. Germany's labor movement has traditionally been a force to be reckoned with. German autoworkers, who make up 60 percent of Volkswagen's worldwide workforce, are the highest paid in the world and among the least flexible. For example, resistance by labor unions blocked some forms of assembly-line automation long after they had become standard at competing

## The Shortest Distance Between Two Points

**One reason Volkswagen was able to increase output** despite a shortened workweek was a new production management system whose motto is "the right information at the right time and the right place." Developed to build the Polo automobile in VW's Wolfsburg plant, the system is now being implemented worldwide. A joint development by VW and its Audi and VW-GEDAS groups with IBM German subsidiary IBM Informationssysteme GmbH, the client/server system links assembly-line workstations to central databases and mainframes. It monitors and controls the construction of a car from bare chassis to finished product, matching assembly-line plans to assembly-line reality.

When a car body emerges from its lacquer bath, it receives an identifying bar-code sticker. As the body moves down the assembly line, the system delivers parts as they are needed, watches for machine breakdowns and keeps an archival record of each car's construction. The flexibility the system provides allows VW to build cars according to the features and colors customers want, and to respond quickly to changes in overall demand.

*–J. Ewing*

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**WOLFSBURG** *(below) was founded around the Volkswagen auto plant.*

## BUSINESS CHALLENGES

- Restore profitability and long-term viability despite the recent recession, increased foreign competition, a changing marketplace and inflexible labor conditions
- Reduce operating costs while minimizing traumatic and politically untenable domestic layoffs
- Increase cycle speed from development to production to delivery

shops, according to one VW watcher.

Given these factors, Volkswagen couldn't restore profitability by slashing jobs unilaterally—as many as 30,000 domestic positions were thought to be expendable. Instead, VW adopted a four-day workweek for its Germany-based employees beginning Jan. 1, 1994. Although workers cut their hours by 20 percent (and their wages by only 16 percent, thanks to tough negotiations), the company did not reduce production by a corresponding amount. In fact, production increased slightly in 1994 as demand improved, with IT enabling assembly-line efficiencies to help shoehorn five-day-plus production levels into four days of work (see story, Page 76).

Volkswagen's political and labor realities are not lost on its information systems leadership. Dieter Schacher, VW's CIO equivalent, has adopted what he calls a "holistic approach" to IT restucturing. This meant that while cost was an important factor in reengineering, it was not the only one. "The world is not so simple that you can manage only according to money. The biggest element is the person," says Schacher, corporate executive director, organization and information systems. Schacher reports to Jens Neumann, the member of VW's board of management in charge of the reengineering project.

Most of Schacher's efforts in support of VW's turnaround seem typical of any dispersed manufacturer. However, as a result of labor sensitivity, IT restructuring was directed not toward worker replacement, but rather toward more effective communications and efficient deployment of resources. The ultimate goal was to bring VW's use of IT up to par in speeding the process of bringing a car from the drawing board to the dealer showroom. That meant rationalization among VW's international operations, better integration among designers, better electronic monitoring and control of the factory floor, and improved communication with dealers and customers.

Part of Schacher's task was to rationalize and unify a diverse array of sometimes incompatible platforms and software. These had grown willy-nilly over the years across VW's dispersed operations. (The Volkswagen Group also includes Audi, the Spanish automaker SEAT and the newly acquired Czech automaker Skoda. The company has factories in such countries as Brazil, Canada, China, Mexico and South Africa.)

**There's nary a Wolfsburg family that doesn't earn some of its daily bread from Volkswagen.**

Before reengineering, VW relied on expensive, custom software. This time around, the company sought instead to use standard solutions, though off-the-shelf products were sometimes modified to meet its needs. For example, SAP software was chosen for administrative processes worldwide, but it is customized locally when necessary.

**IS STRATEGIES**

- Speed the flow of information among designers, managers and dealers
- Enable factory-floor efficiencies to enhance productivity in shortened work schedule
- Achieve IS efficiencies by promoting common practices and standards across dispersed global sites, divisions and dealerships

Whenever possible, the company purchases globally (a doctrine that applies to car parts as well as software), and it has reduced the number of standards to a handful companywide. In the product development process, VW is using two CAD/CAM standards: IBM's CATIA for surface data and Pro/Engineer from Parametric Technology Corp. for volume-oriented applications. (The same thing is happening on the assembly line: By mid-1996, the company plans to have reduced the number of chassis for its high-volume models from 16 to four.)

The company's IT suppliers include most of the usual suspects, such as IBM and SAP. Volkswagen's size required that it work with firms experienced in large-scale projects, which limited its choices, Schacher says. VW also experimented with full-scale outsourcing as a way of cutting costs, he says, but concluded its in-house expertise was superior. In fact, another important supplier is VW-GEDAS, an 850-employee subsidiary that provides software and information services for VW and other companies.

Schacher's group sought to function as a borderless service provider—he calls it a virtual company. That approach is designed to cut across traditional organizational boundaries, remove bureaucratic obstacles and build cars faster. The IS team identified the best IT solutions and exported them from centers of excellence to other parts of the organization. A materials-handling system developed at SEAT was exported to Brazil and Argentina. The system used to manage production at Volkswagen and Audi plants in Germany is being implemented worldwide. This approach, Schacher says, significantly speeded up the transferal of best IT practices.

Not surprisingly, communication was essential to these cross-border efforts. But given the poor infrastructure in places like the Czech Republic, home of Skoda, telecommunications was a major headache, particularly during the first few post-Communist years. Now, Schacher says, Skoda is as well integrated into VW's IT system as SEAT or Audi.

> **"The world is not so simple that you can manage only according to money. The biggest element is the person."**
>
> *–Dieter Schacher*

**COMING UP**

**European Spotlight: Society for Worldwide Interbank Financial Telecommunications**

Volkswagen sees its dealers as partners in identifying customer needs, and for that reason company doctrine calls for them to be involved from product development to delivery. VW is still a few years away from bringing dealers under the company's IT umbrella, however. A new system using standard software to link dealers to the company will be installed in Germany in 1997 and will be used in the 13,000 VW, Audi, SEAT and Skoda dealerships around Europe.

Two years after the restructuring began, IS has met most of its goals under the reengineering plan, contributing to efficiencies that helped Volkswagen produce more automobiles in less time without causing social hardship. Companywide, the number of workers dropped by 6.2 percent during 1994, but that was due to early retirements and other measures. Productivity, meanwhile, increased by 7.4 percent in the Volkswagen Group, and the company has agreed to guarantee employment levels into 1997 and continue with the four-day week.

The firm also appears to be getting back on track financially. After a modest 1994 profit of 150 million marks, the Volkswagen Group reported after-tax profits of 113 million marks ($79 million) for the first half of 1995.

Nevertheless, some analysts remain skeptical of Volkswagen's progress. VW watchers predict that the company cannot remain competitive without shifting more production abroad and laying off German workers. "You have to let people go," says an analyst for a well-known consulting firm, who does not want his name used.

Schacher is more optimistic about the company's prospects. But he concedes that, "change was painful, and it's not over." CIO

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# Go Configure

The dilemma confronting most information technology specialists and managers today is not whether to use CM tools but rather which tools to use

**BY DANIEL GROSS**

The nature of software development has changed since the days when Bill Gates and Paul Allen hacked out their Basic program in the 1970s. Computer software that comprises strings of computer "DNA" has revolutionized businesses by allowing machines to run other machines and keep tabs on quality, maintenance and development processes. Today, a software program may consist of hundreds of thousands of lines of code—Windows 95 contains 11 million lines of it—written by several dozen programmers working in several different offices on computing environments ranging from PCs to mainframes. What's more, new versions of software grow atop existing code and merge with other systems.

"The software necessary to support an enterprise is not the effort of one person on one day's work but rather the effort of many people coming up with many individual pieces," says Paul Levine, president and chief executive officer of Atria Software Inc. in Lexington, Mass. "But although pieces are separately created, they have to be deployed in some kind of synchrony. They need to have a maintained consistency by some kind of automated process."

Yet with the continued demise of the mainframe, software developers increasingly operate in systems with no central point of control. "There's a bit of irony in the fact that developers who specialize in automating other technologies have been slow in automating their own critical processes," says Leon Presser, founder and chairman of Softool Corp., the Goleta, Calif.-based firm that claims to have invented configuration management (CM), the umbrella term used for the expanding range of crucial development tools needed to manage that increasingly complex world.

Configuration management tools, thought of as the institutional memory of the software development process, serve as an ultimate guide to the perplexed on the software assembly line. They act as a sort of online database, keeping tabs on all the components, dating different versions, identifying who wrote them and monitoring their status through the four stages of the life cycle: design, coding, debugging and testing. CM products allow developers to pull up different versions of applications and note the relationships between system components. The products follow revisions—changes to single files or objects—and versions—changes to groups of files. And as they become more prevalent, CM tools are helping transform software development from a handicraft, conducted on a small scale by a few artists, into a commercial industry.

"In 1989 through 1990, the only people who used CM products were those in telecommunications and de-

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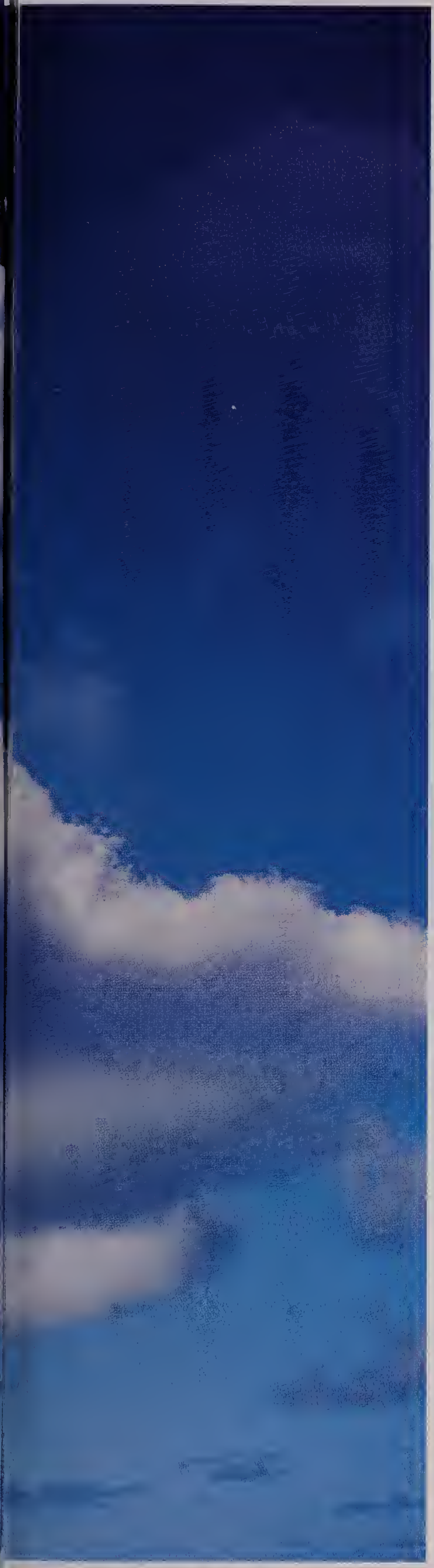

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fense projects," says Tani Haque, chief executive officer of SQL Software, based in Vienna, Va. Now, rather than simply regarding CM products as another arrow in an ever-expanding quiver of necessary tools, Haque believes more CIOs are coming to see CM as an integral part of business processes. "Would you manage a company without a financial process?" he asks rhetorically. "Of course not. So how are you going to do software engineering without process?"

Compared with other branches of the software industry, however, CM is relatively small change. But Ovum Ltd., a London-based consulting firm, projects the overall market size to grow from $180 million in 1993 to $493 million in 1995, reaching $951 million in 1997.

What accounts for such optimistic growth projections? The market is radically under-penetrated, for one thing. Ovum estimates that in 1993 there were 2 million "serious software developers" in Europe and the United States—each a potential user. Calculating an average figure of $2,000 per seat and two users per license, Ovum says the total potential market is between $1 billion and $2 billion. "This is a tool that supports tool development, so it's never going to be as big as the primary tools are," says Paul Cubbage, director of client/server software at Dataquest Inc. in San Jose, Calif. "But it should be a robust market in the next couple of years."

The recent growth of CM products points to a universal press for quality and process controls. Standards, long de rigueur in other industries, have finally come to roost in software development. Europe's ISO 9000 standards now call for the use of CM tools. "For regulatory purposes, we must show that we have control of our product," says Nick Maxton, IT quality support analyst at Glaxo Operations Primary Division, a unit of London-based drug powerhouse Glaxo Wellcome plc. "But it's also good practice to have that level of control." In addition, certain clients—the U.S. Department of Defense, to name one—require very careful accounting of the software development process. Finally, with today's product-liability codes, software manufacturers can theoretically be held responsible when things go haywire.

> **"Would you manage a company without a financial process? Of course not. So how are you going to do software engineering without process?"**
>
> *–Tani Haque*

But CM tools aren't employed just to meet strict standards. "It's not just a quality tool, it's also a maintenance tool," says Steve Henning, product manager at Irvine, Calif.-based Continuus Software Corp. (formerly CaseWare Inc.), which peddles its CM products to 4,000 developers at defense contractors and companies such as Apple Computer Inc. and Motorola Inc. The company's Continuus/CM product offers "problem tracking" through e-mail templates that pop up automatically to let users file problem reports, for example. "Our particular tool gives you the capability of defining a lifecycle process for each one of the objects that you manage in your system," Henning says. And since maintenance can cost a lot of time and money, CM tools can contribute to the bottom line.

In many ways, CM tools act as sort of an insurance policy. "Any large project is an exercise in controlled chaos. From the start of the project to the time of implementation, you'll have three or four moments where everything falls apart and nobody on the project has any idea what code is valid, what works with what," says Lan Barnes, principal of San Diego-based Icon Consulting. Barnes uses Intersolv Inc.'s PVCS product when working on distributed databases for microcomputer networks in the financial industry. "It's at these moments that the version-control system is going to pay for itself. Without version control, you're lost. And you frequently have to re-create a good deal of your recent effort," he adds.

"Should some trauma occur where we have to rebuild one of the systems, we can rebuild it in 40 minutes instead of taking days or man weeks," says Maxton.

In 1993, Glaxo Operations was seeking to update the computer tools it used to monitor development and application systems at its manufacturing sites. "We had two options," says Maxton. "We could either undertake an internal project ourselves and build an internal version-control system, or we could go out into the marketplace and see what was there."

The company reasoned that it would save time, trouble and money if it purchased one of the growing number of configuration management products on the market. After asking several vendors to respond to its requirements, Glaxo chose SQL Software's PCMS (Process Configuration Management Software). "We needed something that would manage the whole process all the way through," says Maxton. "It came down to a short list of three or four packages, and after further investigation, PCMS was the one that best fit our requirements."

If CM products have been somewhat slow to catch on, it's because some resourceful developers have simply devised their own tools. Throughout the 1980s and early 1990s, the Virginia Beach, Va.-based Naval Surface Warfare Center, which produces combat systems for shipboard use, developed its own tools. It eventually decided to buy commercial tools three years ago, when it shifted from a Unix environment to a client/server environment. It, too, chose SQL Soft-

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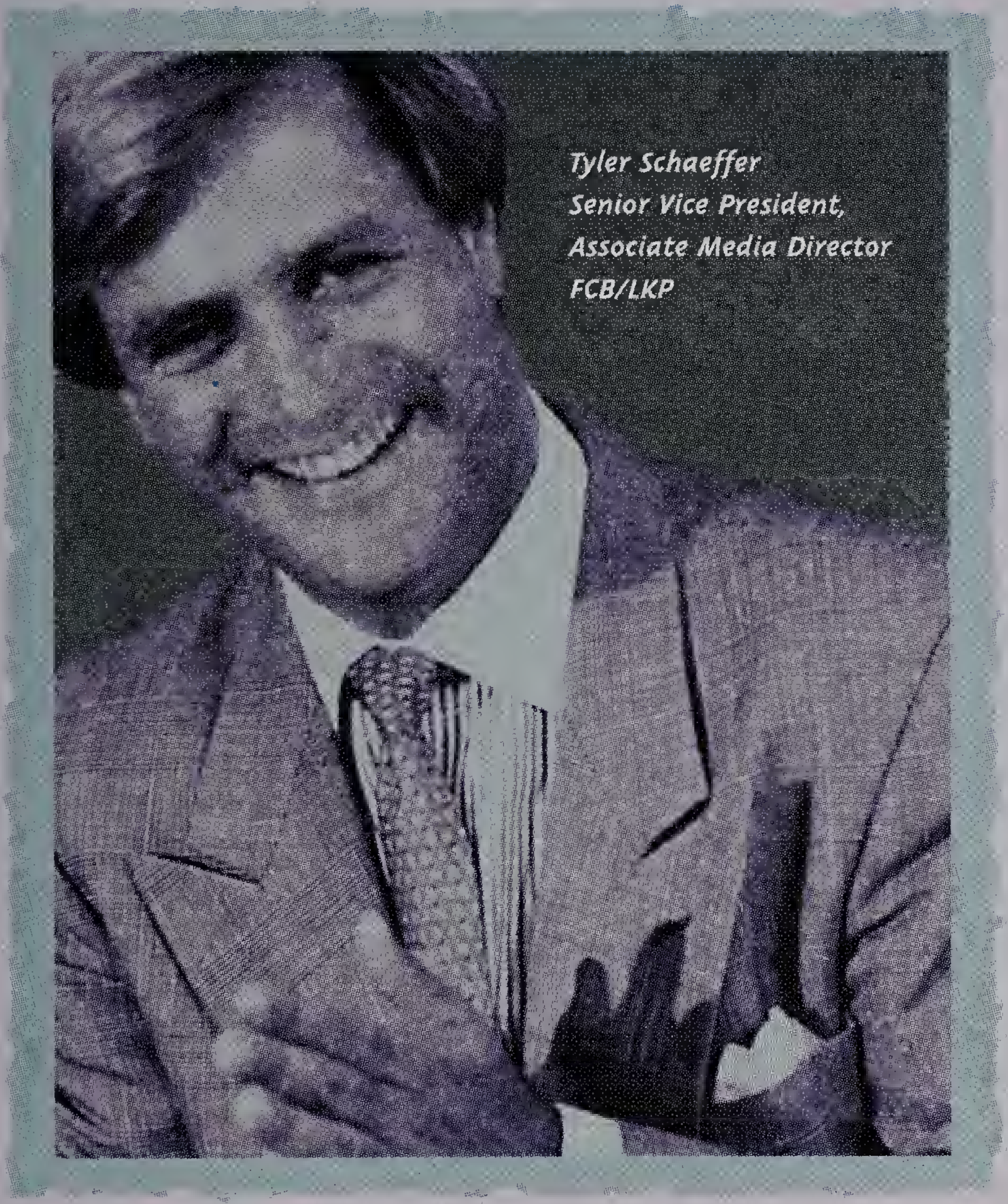

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CIO Communications Inc. • An IDG Company • 492 Old Connecticut Path • Framingham, MA 01701 • 508-872-0080 • http://www.cio.com ware's PCMS. "It basically gives you very good product controls so you know what went into whatever you released," says Raymond Gluck, the center's program and library control officer. "Within the build process, we like that the actual processes are hidden from view and don't depend on those people knowing the actual process that goes on behind the scenes." The organization has about 30 people working on PCMS, so it purchased 19 licenses—at about $3,100 a seat—plus an annual maintenance fee of $700 per seat.

That's the typical arrangement for a CM product. Clients pay an upfront fee for licenses plus a maintenance fee for each one. But that doesn't mean you need to buy 20 licenses if you have 20 developers. Rather, it is typical to purchase one license for every two to four programmers.

The choice shouldn't be made lightly, however. "Setting up version-control management at the beginning of a project is about as important as the hardware and software you select for the project's success," says Icon Consulting's Barnes. And as commercial products are replacing home-grown systems, there is a growing array of products to choose from in many different environments. "Three years ago, the tools that were available for CM were pretty limited for the PC world, especially for large teams," says Gene Forte, principal at Forte Research, a Portland, Ore., consulting firm. Now, he notes, developers can choose from seven or eight solid products made for every major computing environment.

Historically, there have been a few dominant products. Intersolv's PVCS product line is "the leading SCM tool for PC-LAN-based development," according to the Gartner Group in Stamford, Conn. PVCS, which led the Rockville, Md.-based Intersolv to sales of $120 million in fiscal 1995, accounts for up to 70 percent of the PC-based market. For mainframe users, CA-Endevor, originally produced by the former Legent Corp. (which was acquired in 1995 by Computer Associates International Inc.), is the most popular mainframe product. And Silicon Graphics Inc.'s Developer Magic Tools are established Unix tools.

> **"Setting up version-control management at the beginning of a project is about as important as the hardware and software you select."**
>
> *–Lan Barnes*

But as client/server computing environments become more prevalent, more products are being pitched to Windows environments. And the competition is steep. Companies on the rise include Atria, whose 3-year-old Unix-based product, called ClearCase, is popular among software database developers like Oracle Corp., Sybase Inc., Informix Software Inc. and Versant Object Technology Corp. It now has 21,000 copies of its Unix-based product installed at some 550 clients. This year, Atria brought out a version for Windows NT. But the ultimate Windows player may turn out to be Visual SourceSafe, originally called SourceSafe by its developer, One Tree Software. Microsoft Corp. acquired One Tree in November 1994 and substituted SourceSafe and its new version, Visual SourceSafe, for its home-grown Microsoft Delta tool. Last winter Microsoft shipped a new version of SourceSafe that supports MS-DOS, Windows, Windows NT and Macintosh development environments. Visual SourceSafe also supports Windows 95.

While most products were originally made for one computing environment, the new generation of products can operate across multiple systems simultaneously. SQL Software's PCMS can run concurrently on Unix, VMS, Windows and Windows NT. Softool's new product, CCC/Harvest, designed for client/server environments, allows users to mix platforms together with complete interoperability and a common graphical user interface. The same is true for IBM Corp.'s CMVC tools.

When companies do purchase CM products, they're not just buying a box and a few disks. Although PCMS is not customized, Glaxo "worked together with consultants from PCMS and built various scripts and procedures that we need for ourselves," says Maxton.

And the transaction doesn't end with the sale. "After the tool is purchased, our mission is to get people operational and seeing the return on their investment," says Tom Burton, vice president of education and consulting at Softool. Softool has a staff of consultants who visit customers, and it runs training courses at its corporate offices. "It's a matter of helping users look at their current procedures—what's working, what's not, how that could be improved upon and then how they can automate that."

The tools are flexible. "We can have from three or four seats to hundreds of seats. It's applicable to large teams as well as small," says Barnes, who has projects that require anywhere from one to 40 programmers. However, companies shouldn't merely consider their size when hunting for CM tools. Rather, they should consider the complexity of the software problem. "The question is not a test of how big the shop is but how complex the software management problem is," says Atria's Levine. After all, companies can find themselves needing to grow or expand a unit rapidly. As Softool Marketing Director Linda Fritzsche puts it: "You need a tool that will meet your needs today but that will let you grow as well."

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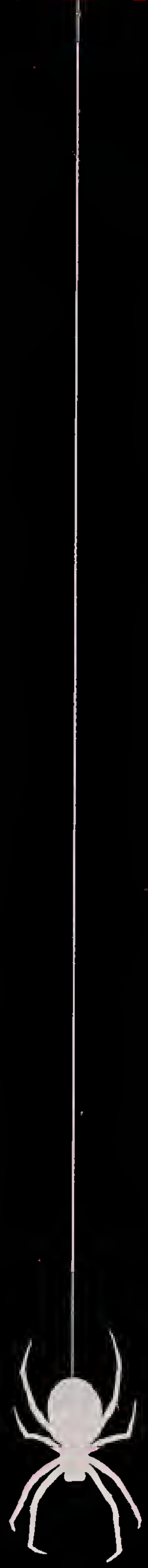

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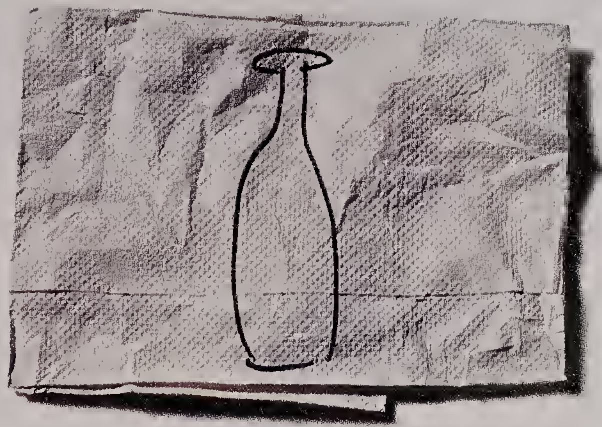

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To develop an ROI model, the user inputs the total number of LANs and desktops to be supported. The number of LAN managers, application support people and supervisors needed are automatically determined using current industry figures. The various costs associated with in-house support, including salaries, benefits, training, hardware, software and overhead, are calculated. The ROI model then presents a cost summary statement annualized over three years. Next, it presents a comparison between the annual costs of utilizing an out-tasking service or hiring additional staff to manage and support remote-office networks and end users.

The ROI model can be used by VARs and systems integrators that wish to demonstrate the cost of remote-office support to customers. It is available free of charge to companies considering contracting with an outside service organization to provide remote-office support and management. It can be obtained directly by calling Acsys at 800 GO-ACSYS.

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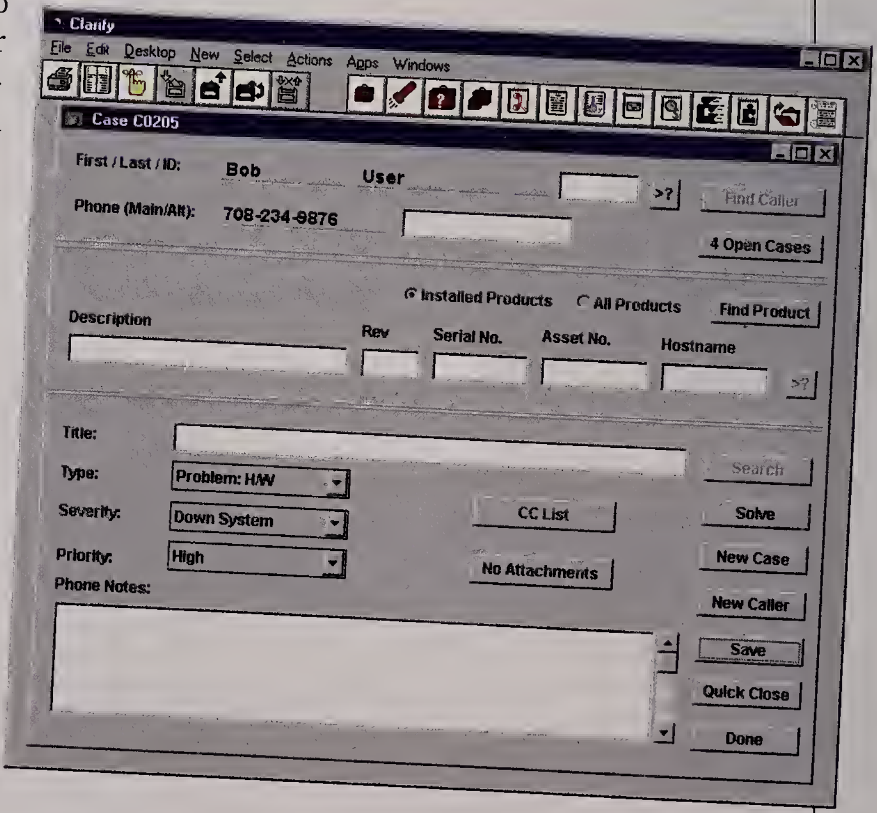

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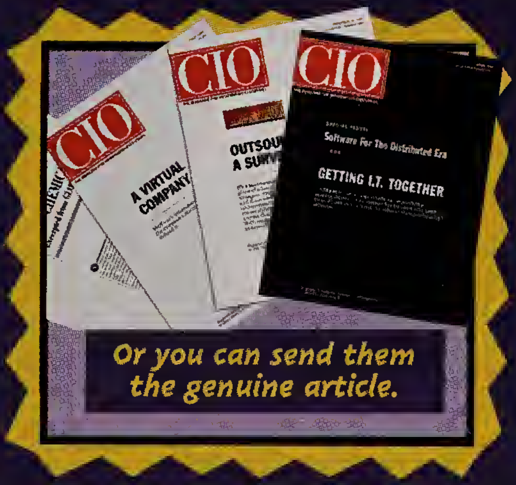

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**The dilemma for a consultant is that if he or she tells you the truth and it pisses you off, they get fired and revenue goes to hell.**

*Continued from Page 96*

look at IS because the troops were anxious on account of being unable to do at work what their kids could do at home. I talked to this CIO at the behest of a big vendor that wanted a neutral party to be the consultant and then use the connection to sell this poor fellow millions of bucks' worth of new equipment and services. This is the guy who asked me about my consulting methodology. I told him I didn't have one but added that I would try to find what his problem was, figure out a way to fix it, make certain the fix would work and then send him a bill. That's what I do. He recoiled. Apparently, the clients have been well-trained to demand their dose of flimflam! So it seems I may need a name or an acronym. How about "F-Cubed?"—find it, figure it out and fix it. Unfortunately, the F words can be tricky.

Consultants' performance is measured on revenue, meaning how much money they can get you to pay them for as long a time as possible. I have yet to find a consultant (among the "real" consultants I've known) who was paid on the basis of results measured, say, two years after they told you what you should do and you had done it. Regular working stiffs get measured on results all the time. The dilemma for a consultant is that if he or she tells you the truth and it pisses you off, they get fired and revenue goes to hell. And they can't have that. So what they do instead of telling the truth is figure out what you (or their sponsor) want the answer to be and run around gathering enough facts to support the desired recommendation. This is not always such a bad thing, provided you (or the sponsor) have a really good idea what the answer ought to be and are not simply reacting to something you saw in the paper, heard at a conference or read in the latest Tom Peters book.

A friend of mine has a situation brewing now that illustrates a consultant's ethical dilemma. She advises a business that is betting the ranch on a new company's new technology. Well, the vendor isn't exactly new, but it is expanding rapidly—everybody my friend meets has wet ink on their ID cards and the company is courting capital investors. The new product just "shipped," but she can't seem to find any actual customers (the company swears there are some). The key IT executives of the company my friend is advising had a relationship with the vendor through a previous employer; they say that the vendor's new product is the "only" solution that can meet their needs—and there are zero alternatives.

So, what should my friend do? If she were the boss rather than the consultant, she would say, "No way." Because the premise—that this brand-new product is the serendipitous only chance for the client company's survival—is completely ridiculous. As a consultant, however, she risks the ire of her sponsor by saying his technical team has a gear loose. (And if they screw up and choose the wrong solution, she gets more work at big bucks/day!) Her sponsor wants to believe in his IT team and in the vision that bleeding-edge technology will confer a substantial advantage in the marketplace. Unfortunately, her sponsor's technical team is fitting a yet-undefined problem to the one solution they have affixed in their minds. And it's not at all clear that the sophistication supposedly unique to this risky solution is mandated by the problem they have to solve (which, after all, they're still in the process of defining).

My friend doesn't know what to do. I told her to bag it—take the money, bill for as many hours as she can and not worry about the long-term effects. That's what a consultant's supposed to do, isn't it? She can always blame the team for failing to implement her recommendations properly. And, hey, the client will forget where they filed her report. The important thing is that the sponsor will remember she shored up the conclusions they wanted to be reached. "Be a hero," I said. "You'll get called back the next time."

In short: Work on your methodology.

The company I used to work for hired consultants because the people there didn't want any new ideas at all. What they wanted was job security: "Look, boss, those consultants recommended by those other consultants and used by all the big guys told us we should do it. I mean, who are you gonna believe? They're so much smarter than we are, and they talked to everybody and did their 'best practices/best of breed' stuff, and we worked through their methodology. And, yeah, it didn't work out so great, but they insist that they were right in their recommendations and that we just implemented it all wrong. And maybe that's true. But is that our fault? I think maybe we just got too lean from all the reengineering...."

I don't know what my friend will end up doing. A lot will depend on whether she really wants to be a consultant or wants to get a regular job. As for me, I'm working on my methodology.

---

*W.F. Dyle is the pseudonym of a former CIO now drawing up the incorporation papers for F-Cubed Consultants Inc.*

## Editor's Note:

Among CIOs and other executives, consultants are perennial lightning rods for strong feelings. In a future *CIO Magazine,* we will publish the reactions of various consultants to the issues raised in this column. In the meantime, we invite readers on both sides of these issues to weigh in with their perspectives, selections from which we will post on the "*CIO* Online" Web site (*http://www.cio.com/CIO*). Send e-mail to *mccreary@cio.com.*

*If you think "veronica" and "archie" are comic strip characters, you have a lot of reading to do.*

*If you think a "gopher" is an animal that ruins your garden, you have a lot of reading to do.*

*If you think the "World Wide Web" is a sinister take-over plot by mutant spiders, you have a lot of reading to do.*

*If you think a "flame" is something you sing around during a campfire, you have a lot of reading to do.*

*If you think a "usenet" is a fishing device, you have a lot of reading to do.*

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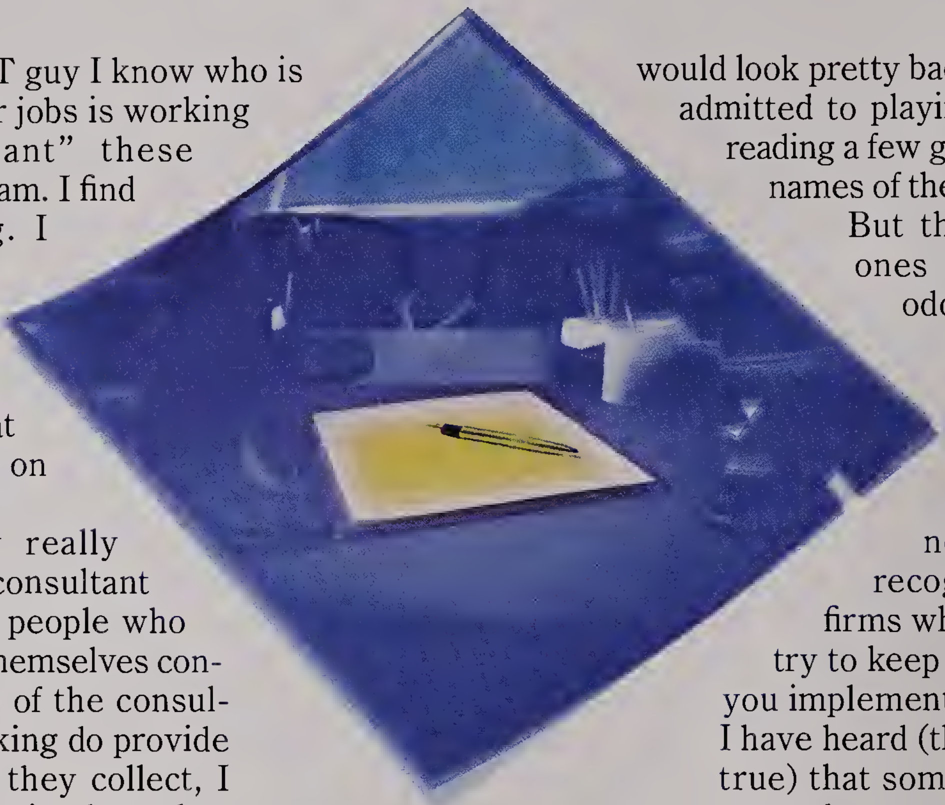
# Meet My Methodology

BY W.F. DYLE



**ALMOST EVERY** IT guy I know who is between regular jobs is working as a "consultant" these days—as I now am. I find that confusing. I found it confusing before I became a consultant, and it is even more confusing now.

But, then, I believe that consulting is confusing on purpose.

First of all, nobody really knows anymore what a consultant is, since so many of the people who are out of work now call themselves consultants. Although some of the consultants who *are* really working do provide value for the large fees they collect, I suspect that others aren't altogether clear on what it is they actually do. I have some theories about this that I believe may spring from the all-important notion of "methodology." A methodology is a form of linguistic bedazzlement with which consulting companies misdirect your attention while pursuing their core competency of pulling a rabbit out of *your* hat (also known as "acquiring your assets"). Still, clients expect to be entertained in the course of having their assets acquired. So when, for instance, I tried to explain to one of my clients that I had no methodology, there was great consternation. How could I possibly be helpful if I didn't have a methodology? But, I guess I'm getting a little ahead of my story....

Some neo-consultants are simply folks who do regular IS jobs, but without getting any benefits, in exchange for very high salaries that the contracting company can hide because the fees are paid out by the hour or the day. That way, the company doesn't blow its head count. It's like buying a car: As long as the monthly payment is manageable, no one thinks about the total cost or the little "extras" that get added on. Other neo-consultants are "paper consultants" who really do very little actual work other than look for another regular job. Conventional wisdom says that it would look pretty bad on their resumes if they admitted to playing golf, fixing the porch, reading a few good novels or learning the names of their kids between gigs.

> *Sometimes consulting seems confusing by design. But slowly it dawns on you that maybe the ultimate design is for the consultant to hold the client upside down and shake him until all the money falls out of his pockets.*

But the *real* consultants—the ones with the snazzy methodologies—are the scariest examples of the breed. These consultants can cost you your job. They can be very smart about your business, becoming nationally recognized partners in their firms while you, in the meantime, try to keep your business running as you implement their recommendations. I have heard (though I'm sure it can't be true) that some big consulting engagements become tutorials for the consulting firms' young, ambitious post-MBAs, and you (or I) get some unplanned job-enrichment experience as teachers. Hey, I like being a teacher; in fact, I'm a *good* teacher. But I worry about some of the students. Consider the following:

A headhunter is looking to hire an IT guy for a consulting firm. Seems the consultancy is a little bit behind the times in its own technology use. The guys they've had working on it—including their own consultants—have royally screwed things up. So they're in a big hurry to hire in some outside talent to fix the situation. One of the leading candidates for fixing up the consulting firm's IT department happens to come from a company whose IT department the consulting firm had "fixed"—in such a way as to cause their now-prospective savior to lose his job. So, explain to me why, if a guy is so good at fixing problems that the consulting firm now wants to hire him to fix its problems, wasn't he good enough to fix the problems at the company that hired the consulting firm in the first place? This is a true story. So bizarre. One in a million, right?

But, wait...there's more! Another CIO, who works for a government agency, was told by his boss to find a consultant to

*Continued on Page 94*

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**Datawatch Corporation**
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☑ Please send me a *FREE* Monarch evaluation kit which includes product information, a demo disk and an informative White Paper entitled *Report Mining: A new way to access corporate information*. For an even faster response, call 1-800-445-3311 (508-988-9700 if outside the U.S.), or fax this card to 508-988-0105.

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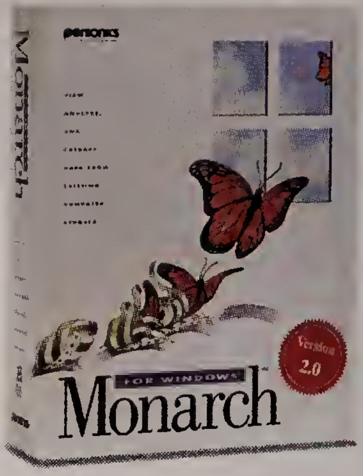

DATAWATCH®

**MONARCH. The fastest, easiest way to access legacy data.**

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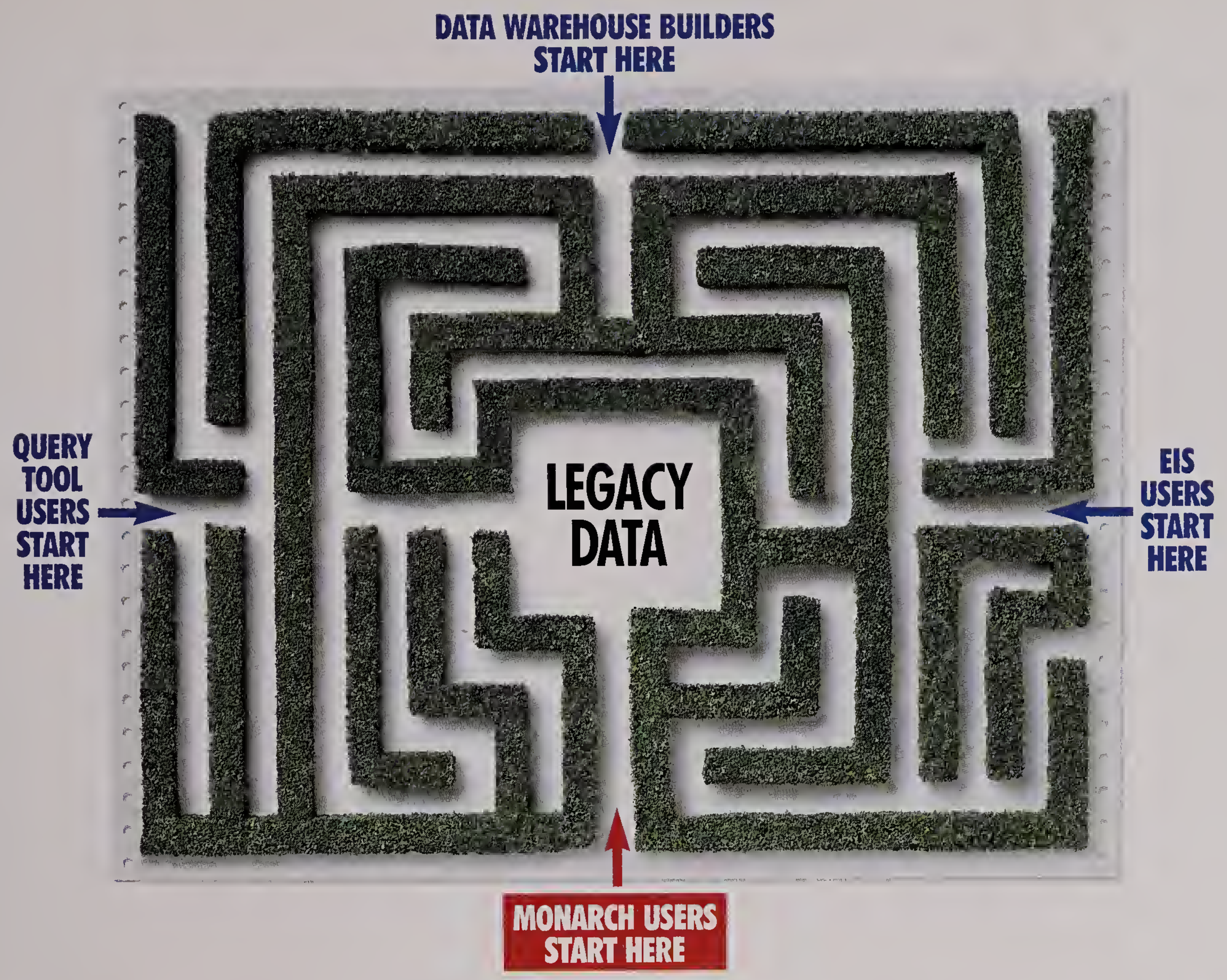
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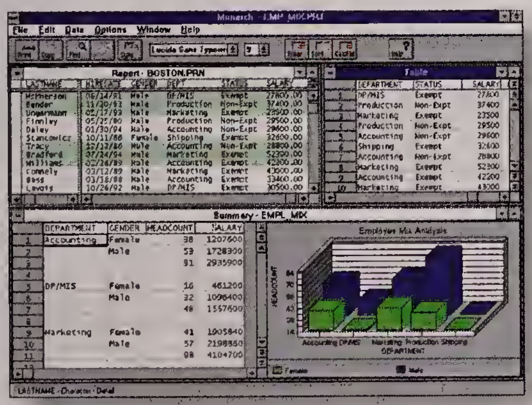
# There Are Many Ways To Access Legacy Data. 100,000 Monarch Users Found A Shortcut.

Chances are, someone in your organization is already using Monarch™ for Windows to access legacy data. It's one of those applications that comes in through the back door and soon, entire departments are using it. In fact, more than 100,000 copies have been sold.



*Monarch brings existing reports on line and lets users access report data. It works with reports produced on any mainframe, midrange, client/server, or PC system.*

Monarch is the leading product in an emerging software category called *report mining systems*. It lets PC users dig information out of spooled report files. Input a report file to Monarch and out comes live data that users can query, filter, analyze, visualize, and export to other applications.

Monarch offers everything you would expect in a state-of-the-art business intelligence tool, including drilling, charting, and multi-dimensional reporting capabilities.

What's different about Monarch is its ability to leverage *existing* reports and reporting systems as a source for data. You don't need to build a data warehouse or deploy special middleware technology. Monarch works right out of the box.

That's why IS managers and industry analysts are embracing Monarch as a breakthrough data access product.

Monarch requires no reengineering and complements whatever comprehensive information delivery systems are ultimately put in place. It can be part of a strategic data access solution, or simply a tactical measure to satisfy data-hungry PC users who want immediate results.

**DATAWATCH®**

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Tel: (508)988-9700 Fax: (508)988-0105

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